

Maths

For The Primary Stage

6th. Primary



Exercises

First Term 2018

UNIT 1

Ratio

Meaning of the Ratio

Properties of ratio

Miscellaneous exercises on ratio and its properties

The ratio among three numbers

Applications on ratio (The rate)

Exercise 1

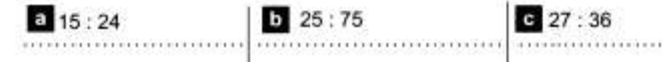
Meaning of Ratio

Put each of the following ratios in its simplest form :

a) 15 : 24

b) 25 : 75

c) 27 : 36

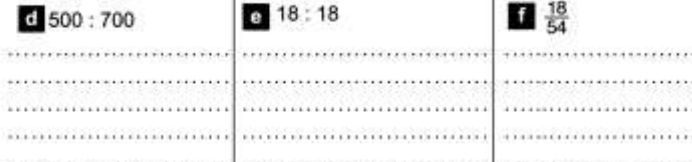


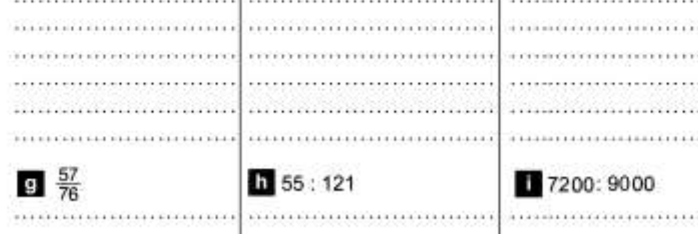


d) 500 : 700

e) 18 : 18

f) $\frac{18}{54}$

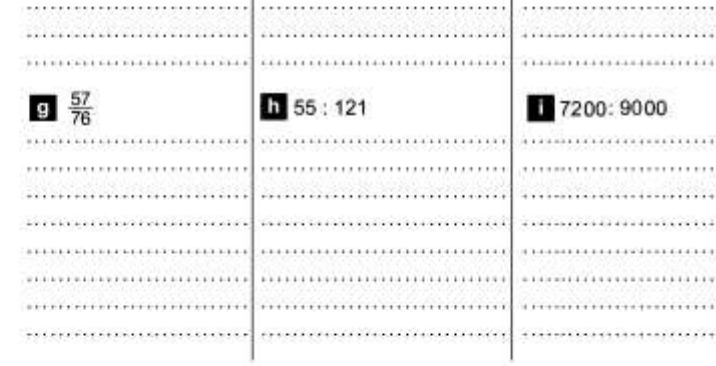




g) $\frac{57}{76}$

h) 55 : 121

i) 7200: 9000



8 Put each of the following ratios in its simplest form :

a $\frac{1}{2} : \frac{1}{4}$

b $\frac{3}{4} : \frac{5}{6}$

c $\frac{1}{3} : 2$

d $5 : \frac{4}{5}$

e $2\frac{1}{5} : 2\frac{3}{4}$

f $\frac{2}{3} : \frac{3}{4}$

g $1\frac{4}{5} : 3\frac{1}{2}$

h $1\frac{1}{2} : 1\frac{1}{4}$

i $3 : 4\frac{3}{4}$

j $\frac{4}{9} : 2\frac{2}{3}$

k $1.5 : 3$

l $1.2 : 3.6$

m $1\frac{1}{5} : 2.4$

n $2.5 : 5$

o $3.2 : 1\frac{3}{5}$

The total number of boys and girls in a school is 480 If the number of boys in this school is 320, find :

a The ratio between the number of boys and that of girls.

b The ratio between the number of boys and the total number of pupils.

c The ratio between the number of girls and the total number of pupils.

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Complete : If Ashraf is 15 years old and Ayman is 25 years old , then :

a The ratio of Ashraf's age : Ayman's age = $\frac{\cdots}{\cdots} = \frac{\cdots}{\cdots}$

or .... : ....

b The ratio of Ayman's age : Ashraf's age = $\frac{\cdots}{\cdots} = \frac{\cdots}{\cdots}$

or .... : ....

The monthly salary of an employee is L.E. 250. He spends L.E. 200 and saves the remainder.

He saves = ...

a Find the ratio of his expenditure to his salary. = $\frac{\cdots}{\cdots} = \frac{\cdots}{\cdots}$

or .... : ....

b Find the ratio of his savings to his expenditure. = $\frac{\cdots}{\cdots} = \frac{\cdots}{\cdots}$

or .... : ....

Choose the correct answer :

a The circumference of the circle : the length of its diameter = ...

($2\pi : 1$ *or* $1 : 2\pi$ *or* $\pi : 1$ *or* $1 : \pi$)

b The ratio between the side length of an equilateral triangle and its perimeter is .... : ....

($3 : 1$ *or* $1 : 2$ *or* $1 : 3$ *or* $1 : 4$)

c The ratio 6 : 18 in the simplest form equals .... ($\frac{6}{18}$ *or* $\frac{3}{9}$ *or* $\frac{1}{3}$ *or* $\frac{2}{3}$)

d The circumference of the circle : its radius length = ...

($1 : 2\pi$ *or* $\pi : r$ *or* $2\pi : 1$ *or* $1 : \pi$)

e If the side length of a square is 4 cm. and the dimensions of a rectangle are 2 and 8 cm. , then the ratio between their areas = ...

($1 : 4$ *or* $2 : 1$ *or* $1 : 1$ *or* $1 : 2$)

f The ratio between the perimeter of a square to its side length = ... : ....

($1 : 4$ *or* $4 : 1$ *or* $1 : 16$ *or* $16 : 1$)

g $4\frac{3}{8} \div 3\frac{1}{2}$ = ...

($5 : 4$ *or* $\frac{4}{5}$ *or* $9 : 5$ *or* $9 : 4$)

Complete the following :

a The ratio between a number and another number = $\frac{\text{........}}{\text{........}}$

b The ratio between the side length of a square and its perimeter is ....

c 9 : 12 = ... : .... (in the simplest form)

d $1\frac{2}{3} : 2\frac{1}{2}$ = ... : .... (in the simplest form)

e The ratio between the perimeter of an equilateral triangle and its side length = ... : ....

f In the ratio $\frac{a}{b}$, the first term is .... and the second term is ....

g The ratio between the perimeter of a square and the perimeter of an equilateral triangle , if the side length of each of them is 3 cm. = ... : ....

h 4 : 6 = $\frac{\text{........}}{3}$ (in the simplest form)

i $\frac{2}{5} : \frac{5}{2}$ = ... : .... (in the simplest form)

j 1 : 1.25 = ... : .... (in the simplest form)

Sheet 1 on unit (1) Lesson (1)

1 ***Choose the correct answer between brackets :***

[a] $50 : 300 =$ .... ($2 : 5$ or $\frac{1}{5}$ or $1 : 6$ or $\frac{1}{10}$)

[b] $\frac{3}{5} : \frac{5}{8} =$ .... $: 25$ (24 or 27 or 15 or 40)

[c] $5.5 : 22 =$ .... : .... ($5 : 2$ or $4 : 1$ or $1 : 4$ or $2 : 5$)

[d] $1.5 : 2.5 =$ .... ($5 : 3$ or $\frac{3}{5}$ or $3 : 25$ or $\frac{5}{9}$)

[e] The ratio between the length of a side of a square and its perimeter = ... : .... ($1 : 1$ or $4 : 1$ or $1 : 4$ or $1 : 16$)

2 ***Complete each of the following :***

[a] The ratio is ....

[b] In the ratio $\frac{9}{17}$, the first term is .... and the second term is ....

[c] The radius length of a circle : the circumference of the circle = ... : ....

[d] $3.2 : \frac{8}{5} =$ .... : .... (In the simplest form)

[e] The ratio between the perimeter of an equilateral triangle and its side length is .... : ....

3 ***In the opposite figure :***

Find the ratio between :

[a] The perimeter of the square and the perimeter of the rectangle.

[b] The area of the square and the area of the rectangle.

2 cm. 4 cm. 6 cm.

4 [a] ***A school has 200 pupils, if 80 pupils of them are girls, find the ratio between the number of boys and the number of girls.***

[b] ***Put each of the following ratios in its simplest form :***

(1) $5 : \frac{5}{4}$	(2) $2\frac{2}{3} : 1\frac{1}{3}$	(3) $\frac{1}{3} : 0.2$	(4) $\frac{15}{45}$

5 ***The teacher of the class asked Mohamed about the reason of his supremacy, he replied that he organises his daily time as follows : 4 hours for studying his lessons, an hour for sporting and two hours for prayers. Find in the simplest form :***

[a] The ratio between the time of prayers and the time of studying.

[b] The ratio between the time of sporting and the time of prayers.

[c] The ratio between the time of studying and the number of hours of the day.

Properties of ratio

Complete the following :

a 500 gm. : 2 kg.

b P.T. 25 : L.E. 2

c 250 cm. : 3 m.

d 18 hours : 2 days

e 1.75 metres : 150 cm.

f 400 cm. : 2 m.

g $\frac{1}{2}$ kirat : 18 sahms

h $\frac{1}{2}$ an hour : 36 minutes

i 300 gm. : 1.5 kg.

j $\frac{1}{2}$ m.^{2} : 75 dm^2

k 30 dm.^{2} : 2700 cm^2

l L.E. $7\frac{1}{2}$: P.T. 250

m 2 years : 18 months

n 2250 cm^2 : $\frac{1}{4}$ m^2

Choose the correct answer :

a) 5 kg. : 500 gram = ... (1 : 100 *or* 1 : 10 *or* 10 : 7 *or* 10 : 1)

b) 400 cm. : 3 m. = ... (4 : 3 *or* 30 : 4 *or* 40 : 3 *or* 3 : 4)

c) 800 gm. : 1.6 kg. = ... (1 : 2 *or* 2 : 1 *or* 5 : 1 *or* 1 : 20)

d) 12 hours : 2 days = ... (1 : 2 *or* 6 : 1 *or* 1 : 4 *or* 1 : 6)

e) 3 m. : 20 dm. = ... (3 : 2 *or* 3 : 200 *or* 3 : 20 *or* 30 : 2)

f) 300 gm. : $1\frac{1}{2}$ kg. = ... (1 : 6 *or* 1 : 5 *or* 1 : 30 *or* 2 : 1)

g) 400 cm. : 6 m. = ... (20 : 30 *or* 3 : 20 *or* 2 : 3 *or* 3 : 2)

h) 5 weeks : 25 days = ... (1 : 5 *or* 5 : 7 *or* 7 : 5 *or* 5 : 1)

i) 7.2 feddans : 14.4 feddans = ... (1 : 2 *or* 2 : 3 *or* 1 : 3 *or* 2 : 7)

j) P.T. 500 : L.E. 15 = ... (1 : 5 or 1 : 3 *or* 3 : 1 *or* 5 : 1)

k) 2 km. : 800 m. = ... (1 : 4 *or* 5 : 2 *or* 1 : 2 *or* 4 : 1)

l) 4.8 dm. : 540 cm. = ... (8 : 9 *or* 9 : 8 *or* 2 : 45 *or* 4 : 45)

m) 40 sec. : 1 minute = ... (40 : 1 *or* 1 : 40 *or* 2 : 3 *or* 4 : 10)

n) 50 gm. : 1.5 kg. = ... (5 : 1 *or* 1 : 30 *or* 1 : 3 *or* 1 : 6)

o) 20 days : 2 months = ... (2 : 5 *or* 2 : 3 *or* 1 : 6 *or* 1 : 3)

p) 24 hours : 2 days = ... (4 : 1 *or* 12 : 1 *or* 1 : 48 *or* 1 : 2)

q) 15 minutes : $1\frac{1}{4}$ hours = ... (1 : 5 *or* 5 : 1 *or* 3 : 25 *or* 25 : 3)

r) 4.5 $dm.^3$: 2500 $cm.^3$ = ... (5 : 9 *or* 9 : 5 *or* 9 : 50 *or* 50 : 9)

s) 5 weeks : 28 days = ... (5 : 28 *or* 28 : 5 *or* 5 : 4 *or* 4 : 5)

t) 14 minutes : 7 hours = ... (2 : 1 *or* 1 : 2 *or* 1 : 30 *or* 14 : 7)

u) 6 kirats : $2\frac{1}{2}$ feddans = ... (10 : 1 *or* 1 : 10 *or* 3 : 125 *or* 6 : 1)

Karim is 1.75 m. tall and his friend Mohamed is 150 cm. tall , find the ratio between Karim's height and Mohamed's.

Ahmed has L.E. 15 He went to the market and spent 725 piastres, find :

a The ratio between the money he spent and the total sum he had.

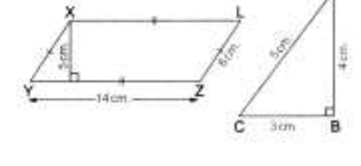
b The ratio between the money left and the total sum he had.

c The ratio between the money left and the money he spent.

By using the opposite figure, find :

a The ratio between the perimeter of triangle ABC : the perimeter of parallelogram XYZL

b The ratio between the area of parallelogram XYZL : the area of triangle ABC



a the perimeter of triangle ABC ....

....

the perimeter of parallelogram XYZL ....

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The ratio ....

....

b the area of parallelogram XYZL ....

....

the area of triangle ABC ....

....

The ratio ....

....

Find in the simplest form the ratio between :

The circumference of the circle whose diameter is 28 cm. and the perimeter of the rectangle whose length is 7 cm. and its width is 5 cm.

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Sheet 2

From unit (1) Lesson (1)
To unit (1) Lesson (2)

1 *Complete each of the following :*

[a] $\frac{1}{4}$ hour : 20 minutes = ... : .... (In the simplest form)

[b] 4.5 : 9 = ... : ....

[c] P.T. 50 : L.E. 1 $\frac{1}{2}$ = ... : .... (In the simplest form)

[d] The ratio between the lengths of two sides of a square is .... : ....

[e] 2 m. : 400 cm. = 1 : ....

2 *Choose the correct answer between brackets :*

[a] The diameter length of the circle : its circumference = ...

(1 : 2 π *or* 1 : π *or* π : 1 *or* 2 π : 1)

[b] $\frac{1}{8}$ kg. : 100 gm. = ... (4 : 5 *or* 5 : 2 *or* 8 : 15 *or* 5 : 4)

[c] 16 kirats : 1 feddan = ... : .... (16 : 1 *or* 2 : 3 *or* 3 : 2 *or* 8 : 3)

[d] $\frac{2}{3}$: $\frac{3}{4}$ = ... : .... (in the simplest form)

(8 : 9 *or* 2 : 3 *or* 2 : 4 *or* 8 : 7)

[e] 18 hours : one day = ... : .... (2 : 9 *or* 1 : 3 *or* 3 : 4 *or* 4 : 3)

3 *Find each of the following ratios in its simplest form :*

[a] 6 days : 2 weeks

[b] 5 dm. : 5 m.

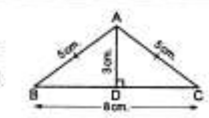
[c] 5 kg. : 7000 gm.

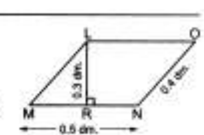
[d] $\frac{1}{2}$ L. : 250 mL.

4 ***The distance between Adel's house and the sport's club which he joins is 350 metres and the distance between his house and his school is 1.4 kilometres. What is the ratio between the two distances ?***

5 ***In the opposite figure :***

Find the ratio between the area of the triangle ABC and the area of the parallelogram LMNO





Miscellaneous exercises on ratio and its properties

The ratio between the number of girls and the number of boys in a school is 3 : 8 If the number of girls is 312 , find the number of boys.

The ratio between the height of each of Ayman and Mina is 9 : 10 If Mina is 144 cm. tall , find Ayman's height.

The ratio between Hany's weight and Wael's weight is 3 : 5 If Wael's weight is 50 kg. , find Hany's weight.

The number of pupils in a primary school is 480 pupils. If the ratio between the number of boys and the number of girls is 5 : 3 , find the number of boys and the number of girls.

The ratio between the lengths of two pieces of wire is 5 : 9
If the sum of their lengths is 126 metres.
Calculate the length of each of them.

The ratio between two numbers is 7 : 12 , find the two numbers , if their sum is 76

The ratio between the lengths of two pieces of cloth is 5 : 9
If the difference between their lengths is 4.8 m ,
find the length of each piece.

The ratio between Sameh's weight and Youssef's weight is 5 : 7
and the difference between their weights is 14 kg.
Find the weight of each of them.

The ratio between the heights of two buildings in a city is 5 : 7
If the difference between the heights of the two buildings is 8 metres ,
then find the heights of the two buildings.

The ratio between Amgad's money and Karim's money is 7 : 9 Find Amgad's money and Karim's money if Karim's money exceeds Amgad's money by L.E. 5

The ratio between the height of a building and the height of Cairo Tower is $\frac{4}{15}$ If the height of the building is 48 metres ،
find the height of Cairo Tower.

Two persons started a food business. The ratio between what the first paid and what the second paid was 3 : 5 ، and the money paid by the second was L.E. 17500 more than what the first paid. Find the capital of the business.

Choose the correct answer :

a If the ratio between what Said saves and what Khalid saves is 5 : 6 and if what Khalid saved is L.E. 72 , then Said saved L.E. ....

(30 ***or*** 50 ***or*** 40 ***or*** 60)

b If the ratio between the number of girls and the number of boys in a school is 3 : 5 and the number of girls is 300 , then the total number of the pupils equals ....

(500 ***or*** 800 ***or*** 900 ***or*** 1500)

c If the ratio of the clever pupils in a primary school to the total number of the pupils is 1 : 6 , what is the number of the clever pupils if the total number of the pupils is 750 pupils ? ....

(25 ***or*** 225 ***or*** 125 ***or*** 250)

d If Walid's weight : Mohamed's weight = 5 : 8 and Walid's weight is 40 kg. , then Mohamed's weight equals ....

(25 kg. ***or*** 64 kg. ***or*** 52 kg. ***or*** 46 kg.)

e If a : b = 5 : 3 and a - b = 8 , then b = ...

(6 ***or*** 8 ***or*** 10 ***or*** 12)

f If the ratio between Rania's height and Shadia's height is 3 : 4 and Shadia's height is 120 cm then Rania's height equals ....

(90 cm ***or*** 40 cm. ***or*** 60 cm. ***or*** 30 cm.)

g The ratio between the ages of two pupils is 3 : 4 and the difference between their ages is 3 years , then the age of the older is .... years.

(3 ***or*** 9 ***or*** 4 ***or*** 12)

Sheet 3

From unit (1) Lesson (1)
To unit (1) Lesson (3)

1 Complete :

[a] If the ratio between Tamer's height and Hend's height is 9 : 8 and the difference between their height is 20 cm. , then the height of Hend is .... cm.

[b] The ratio between two numbers = $\frac{\text{..........}}{\text{..........}}$

[c] P.T. 750 : L.E. 10 = ... : ....

[d] A rectangle of perimeter 42 cm. and the ratio between its length and its width is 5 : 2 , then its length is .... cm. and its width is .... cm.

[e] $\frac{2}{7}$: 2 $\frac{1}{3}$ = ... : .... (In the simplest form)

2 *In one of our schools , there are 750 pupils , if the number of girls = $\frac{2}{3}$ of the number of boys. Find each of the number of boys and girls.*

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3 *Choose the correct answer between brackets :*

[a] Two wires , the ratio between their lengths is 3 : 4 and the length of the first wire is 75 cm. , then the length of the second wire is .... m.
(1 *or* 100 *or* 10)

[b] If the area of a rectangle is 40 cm^2. and its length is 0.8 dm. , then the ratio between its length and width = ... : .... (5 : 8 *or* 8 : 5 *or* 5 : 1)

[c] The ratio between what Yassmien and Marwa has is 3 : 5 , if Marwa has 40 pounds , then Yassmien has .... pounds. (30 *or* 15 *or* 24)

[d] The ratio 12 : 18 in its simplest form by dividing both terms by ....
(2 *or* 3 *or* 6)

[e] If the sum of two numbers is 40 and the ratio between them is 3 : 5 , then the smaller one = ... (8 *or* 15 *or* 25)

4 ***The ratio between the length and the width of a rectangle is 7 : 4 , if the width decreases than the length by 21 cm. , then find the area of the rectangle.***

5 ***If the sum of two amounts of money is L.E. 1800 and the ratio between the two amounts is 2 : 7 , find each of the two amounts.***

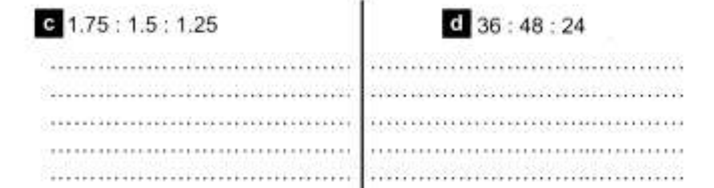
Exercise 4

The ratio among three numbers

Put each of the following ratios in its simplest form :

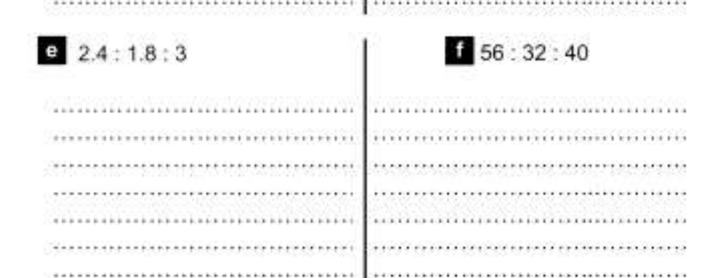
a 180 : 144 : 108

b 2.1 : 0.49 : 1.4



c 1.75 : 1.5 : 1.25

d 36 : 48 : 24



e 2.4 : 1.8 : 3

f 56 : 32 : 40

Put each of the following ratios in its simplest form :

a $\frac{1}{2} : \frac{1}{4} : \frac{1}{8}$

b $\frac{2}{3} : \frac{3}{4} : \frac{1}{2}$

c $2\frac{1}{4} : 6\frac{1}{2} : 4\frac{3}{8}$

d $\frac{3}{2} : 5 : \frac{7}{4}$

e $\frac{3}{4} : 1.5 : \frac{1}{2}$

f $2.5 : 2\frac{1}{2} : 3.5$

Put each of the following ratios in its simplest form :

a 7 kg. : $2\frac{1}{2}$ kg. : 4500 gm.

b 25 dm. : 500 cm. : 7.5 m.

c $1\frac{1}{4}$ feddans : 18 kirats : 288 sahms

Choose the correct answer between brackets :

a) 30 : 40 : 60 = ... (3 : 4 : 6 **or** 4 : 6 : 3 **or** 3 : 6 : 4)

b) 25 : 45 : 100 = ... (20 : 5 : 9 **or** 9 : 5 : 20 **or** 5 : 9 : 20)

c) 0.17 : 0.34 : 1.36 = ... (1 : 8 : 2 **or** 1 : 2 : 8 **or** 8 : 2 : 1)

d) 4.8 : 1.2 : 36 = ... (4 : 1 : 3 **or** 1 : 4 : 30 **or** 4 : 1 : 30)

e) $\frac{1}{2} : \frac{1}{7} : \frac{1}{14}$ = ... (7 : 2 : 1 **or** 1 : 2 : 7 **or** 7 : 1 : 2)

f) $3\frac{1}{4} : 2 : 2\frac{1}{8}$ = ... (16 : 26 : 17 **or** 17 : 16 : 26 **or** 26 : 16 : 17)

g) 2 m. : 400 cm. : 10 dm. = ... (2 : 4 : 1 **or** 1 : 2 : 4 **or** 2 : 1 : 4)

h) $1\frac{1}{2}$ kg. : 1000 gm. : 2 kg. = ... (3 : 2 : 4 **or** 2 : 4 : 3 **or** 4 : 3 : 2)

i) If A : B = 3 : 2 and B : C = 2 : 5 , then A : C = ...

(3 : 4 **or** 3 : 12 **or** 2 : 4 **or** 3 : 5)

j) If a : b = 5 : 6 and b : c = 3 : 4 , then a : c = ...

(8 : 5 **or** 5 : 4 **or** 4 : 5 **or** 5 : 8)

k) If A : B = 2 : 3 and B : C = 12 : 7 , then A : C = ...

(2 : 7 **or** 3 : 7 **or** 8 : 7 **or** 3 : 12)

l) If a : b = $\frac{2}{3}$ and b : c = 3 : 5 , then a : c = ...

(2 : 3 **or** 6 : 5 **or** 2 : 5 **or** 5 : 6)

m) If a : b = 3 : 5 and b : c = 2 : 5 , then a : b : c = ... : .... : ....

(3 : 2 : 5 **or** 6 : 10 : 25 **or** 6 : 2 : 5 **or** 5 : 10 : 6)

If the heights of Islam , Ahmed and Sara are 0.6 m. , 90 cm. and 1.2 m. respectively , find the ratio among their heights.

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If the ratio among the measures of the angles of a triangle is 5 : 6 : 7 and the measure of the first angle is 50° . Find the measure of each of the other two angles.

If the ratio among the heights of three buildings is 3 : 4 : 5 and if the hight of the first building is 12 metres calculate the heights of the second and the third building.

A fruit seller has three kinds of fruit (banana, grapes and Guava)
If the ratio between the weight of banana to the weight of grapes is 2 : 3 and the ratio between the weight of grapes to that of guava is 2 : 4 .
Find the ratio among the weights of banana, grapes and guava.

If the ratio among the ages of Hoda, Mona and Ola is 2 : 4 : 5 and if the difference between the age of Hoda and that of Mona is 8 years. Calculate the age of each of Hoda, Mona and Ola.

The ratio between the length and the width of a rectangle is 9 : 5 . If the perimeter of the rectangle is 56 meters, find out the length and the width of the rectangle, then calculate its area.

The perimeter of a rectangular-shaped land is 440 m.
and the ratio between its dimensions is 3 : 7
Find the area of that land.

Sheet 4 From unit (1) Lesson (1) To unit (1) Lesson (4)

1 ***Complete each of the following :***

[a] If a : b = 3 : 5 and b : c = 2 : 5 , then a : b : c = ... : .... : ....

[b] $\frac{1}{2} : \frac{3}{4} : \frac{2}{3}$ = ... : .... : ....

[c] 1. 12 : 1.68 : 2.52 = ... : .... : ....

[d] 0.25 feddans : 2 kirats : 18 sahms = ... : .... : ....

[e] The ratio between the side length of a rhombus and its perimeter = ... : ....

2 If the ratio between the measures of the angles of a triangle is 3 : 4 : 5 , find the measure of each angle of the triangle.

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3 ***Choose the correct answer between brackets :***

[a] If a : b = 5 : 6 and b : c = 3 : 4 , then a : c = ... : ....

(3 : 5 *or* 5 : 3 *or* 5 : 8 *or* 8 : 5)

[b] $\frac{1}{2} : \frac{1}{3} : \frac{1}{4}$ = ... : .... : ....

(2 : 3 : 4 *or* 4 : 3 : 2 *or* 6 : 4 : 3 *or* 3 : 4 : 2)

[c] 400 piastres : 12 pounds = ... : ...... (1 : 3 *or* 3 : 1 *or* 1 : 4 *or* 2 : 3)

[d] The ratio between three numbers is 3 : 4 : 7 and their sum is 70 , then the greatest number is .... (15 *or* 35 *or* 20 *or* 14)

[e] 16 : 48 = $\frac{1}{\text{........}}$ (2 *or* 4 *or* 5 *or* 3)

4 [a] A piece of land in the form of a triangle , the ratio between its side lengths is 4 : 6 : 7 , if the perimeter of this land equals 51 m.

Find the lengths of its sides.

[b] If the ratio between Adam's money : Nada's money : Seif's money is 6 : 5 : 2 , and the difference between Adam's money and Seif's money is L.E. 200 find the money of each one of them.

5 Divide L.E. 988 among Mohamed, Hany and Amr such that the share of Mohamed is $\frac{1}{2}$ of that of Hany and the share of Hany is $\frac{3}{2}$ of that of Amr.

Find the share of each of them.

Application on ratio (The Rate)

Complete the following :

a A tractor ploughs 14 feddans in 3. 5 hours , then the rate of performance of the tractor = ... feddans/hours.

b If a car covers 180 km. in 3 hours , then its average speed = ... km. /hours.

c A worker paints a wall of area 100 m^2 at 8 hours , then the rate of work = ... m^2/hr.

d The comparing between two different quantities is ....

e If a runner covers 600 m. in 4 minutes , then the rate of distance covered in one minute is .... m. / min.

f A machine produces 1400 metres of textile in two hours. The production rate of the machine in one hour = ... metres / hour.

g If 5 tons of organic fertilizer is needed for fertilizing 10 feddans, then the rate of fertilizing for each feddan = ... tons per feddan.

If a car covered 220 km. in 2 hr. , calculate the speed of the car.

Hassan spends L.E. 45 within three days, what's the rate of what Hassan spends per day ?

A computer coloured printer prints 12 papers every 4 minutes. Find the rate of work of this printer.

A runner covers 6 metres in 10 seconds , and another one covers 3 m. in 0.5 min. Who is faster ?

A machine produces 500 m. of cloth in 2 hr. , another machine produces 600 m. of the same cloth in 2 and a half hours. Which one is better ?

A tractor ploughs 15 feddans in 5 hours. How many feddans does the same tractor plough in 4 hours ?

A car covers 250 km in 4 housr . How many kilo meters does the same car covers in 6 hours?

Sheet 5 From unit (1) Lesson (1) To unit (1) Lesson (5)

1 ***Choose the correct answer between brackets :***

[a] A tractor ploughs 14 feddans in 3.5 hours , then the rate of performance of the tractor = ... feddans / hour. ($\frac{1}{4}$ *or* 4 *or* 10.5 *or* 7)

[b] If a : b = 2 : 3 and b : c = 12 : 7 , then a : c = ...

(2 : 7 *or* 3 : 7 *or* 8 : 7 *or* 3 : 12)

[c] A machine produces 500 m. of material in 2 hours and half, then the rate of the production of this machine is .... m./hour.

(400 *or* 125 *or* 1000 *or* 200)

[d] If Omar drinks 14 glasses of milk weekly , then the rate of what he drinks daily is .... glasses. (3 *or* 7 *or* 14 *or* 2)

[e] If Mohamed spends 15 pounds within 3 days , then Mohamed spends .... pounds / day. (45 *or* 18 *or* 5 *or* 12)

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2 [a] If a car covers 270 km. in three hours , find the average speed of the car through this trip.

....

....

[b] The perimeter of a rectangle = 360 cm. and the ratio between its dimensions = 3 : 2 find its area.

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3 [a] The ratio between three numbers is 6 : 5 : 2 and the sum of the second and the third is 63 find the three numbers.

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[b] A factory produces 200 bottles of juice in 10 hours.

Calculate the production rate of the factory.

4 [a] A machine produces 450 kg. of metal in 3 hours. ***Calculate the rate of production of the machine.***

[b] If a worker paints a wall of area 45 m^2. in 5 hours , what is the rate of his work ? and how many square metres does the same worker paint in 7 hours ?

5 [a] The ratio between the heights of two buildings is 3 : 7 , if the second building is 35 m. high. ***Find the height of the first building.***

[b] A car consumes 160 litres of petrol to cover a distance of 240 km. , find the rate of consumption petrol of that car.

Unit 2

Proportion

- The meaning of proportion
- Properties of proportion
- Drawing Scale
- The proportional division
- Percentage
- Applications on the percentage

Exercise 1&2

The meaning of proportion
Properties of proportion

1 **Complete each of the following :**

a The proportion is ....

b $\frac{2}{3} = \frac{4}{\dots} = \frac{6}{\dots} = \frac{\dots}{18} = \frac{\dots}{30}$

....

....

c $\frac{1}{4} = \frac{\dots}{20} = \frac{7}{\dots} = \frac{\dots}{44} = \frac{\dots}{1.2}$

....

....

d $\frac{4}{5} = \frac{12}{\dots} = \frac{\dots}{12.5} = \frac{3.2}{\dots} = \frac{\dots}{6.5}$

....

....

2 **If the price of one kg of apples is L.E. 8 , complete the following table then write some of forms of proportion :**

The weight of apples in kilos	1	2	4	.....	.....	8
The price in pounds	8	.....	.....	40	48	.....

× ..... ÷ .....

....

....

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....

Some forms of proportion are : $\frac{1}{8} = \frac{2}{\dots} = \frac{4}{\dots} = \frac{\dots}{40} = \frac{\dots}{48} = \frac{8}{\dots}$

Find the value of x in each of the following proportions :

a $\frac{35}{42} = \frac{x}{6}$

b $\frac{1}{2} = \frac{6}{x}$

c $\frac{2}{7} = \frac{8}{x}$

d $\frac{3}{7} = \frac{x}{49}$

e $\frac{24}{x} = 0.8$

f $\frac{10}{11} = \frac{15}{x}$

g $\frac{x}{5} = 3$

h $\frac{3}{5} = \frac{x}{3}$

Use the method of the cross multiplication to find the missing number in each of the following proportions :

a $\frac{7}{9} = \frac{\cdots\cdots}{72}$

b $\frac{5}{8} = \frac{17.5}{\cdots\cdots}$

c $\frac{\cdots\cdots}{21} = \frac{5}{6}$

d $\frac{18}{\cdots\cdots} = \frac{27}{49}$

e $\frac{28}{49} = \frac{\cdots\cdots}{35}$

f $\frac{48}{64} = \frac{7.5}{\cdots\cdots}$

Find the missing term in each of the following for the numbers to be proportional :

a 5 , 6 , 10 and ……

b …… , 8 , 16 and 64

c 0.8 , 4.8 , …… and 12

d 6 , …… , 10 and 3

Find the value of x in each of the following for the numbers to be proportional :

a 9 , 21 , 3 and x

b 5 , 25 , x and 10

c x , 12 , 3 and 4

d x , 8 , 54 and 48

e 8 , x , 10 and 32

f $7\frac{1}{2}$, x , 2.5 and 4.5

Complete :

a $\frac{3}{20} = \frac{\dots}{100} = \frac{1.5}{\dots}$

b If $\frac{4}{7} = \frac{x}{35}$, then $x =$ ……

c The fourth proportional of 10 , 14 and 20 is ……

d If $\frac{8}{x} = \frac{10}{32}$, then $x =$ …… and it is called the …… term.

e From the properties of proportion , the product of the extremes equals ……

f If we multiply each of the two terms of a ratio by the same non - zero number , the original ratio and the resulted will form ……

g The fourth proportional of $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{1}{8}$ is ……

h If the numbers 18 , 24 , A and 60 are proportional , then A = ……

i In the proportion , the product of the extremes = ……

j If the numbers 3 , 15 , 12 and 2 x are proportional , then $x =$ ……

Choose the correct answer :

a If $\frac{2}{7} = \frac{x}{21}$, then $x =$ ...... (6 *or* 21 *or* 12 *or* 7)

b The first term in ...... , 5 , 10 and 20 is ...... (10 *or* 2.5 *or* 40 *or* 50)

c The fourth proportional for the numbers 7 , 5 and 14 is ......

(10 *or* 20 *or* 49 *or* 35)

d The third term in $\frac{3.5}{7} = \frac{?}{12}$ is ...... (3 *or* 6 *or* 7 *or* 12)

e If $\frac{36}{x} = 0.4$, then $x =$ ...... (90 *or* 9 *or* 0.9 *or* 0.09)

f The third proportional to 4 , 12 , ... and 18 equals ......

(10 *or* 12 *or* 6 *or* 4)

g If 0.8 , x , 4 and 5 are in a proportion , then $x =$ ......

(0.1 *or* 2 *or* 1 *or* 0.2)

h If 5 a = 7 b , then $\frac{a}{b} =$ ...... ($\frac{5}{7}$ *or* $\frac{7}{5}$ *or* $\frac{2}{5}$ *or* $\frac{5}{2}$)

Which one of each of the following sets of numbers is proportional ?

a 4 , 7 , 20 and 35

....

b 7 , 8 , 5.6 and 6.4

....

c $4\frac{1}{2}$, 4 , $1\frac{1}{8}$ and 1

....

d 4.5 , 6 , 1.5 and 2

....

e $\frac{3}{6}$ and $\frac{9}{18}$

....

f $\frac{5}{9}$ and $\frac{42}{81}$

....

Find the value of x in each of the following proportions :

a $\frac{x+3}{14} = \frac{1}{2}$

....

....

b $\frac{3}{x-5} = \frac{15}{20}$

....

....

c $\frac{3}{4} = \frac{2x}{32}$

....

....

d $\frac{2x+30}{4} = 25$

....

....

Ali bought 5 kg. of orange , he paid L.E. 15 How much money does he pay to buy 8 kg. ?

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Kareem bought 9 boxes of orange juice cans and he paid L.E. 13.5 Find the price of 24 boxes.

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If 35 litres of milk produce out 16 kg. of butter.

Find how many kg. of butter can be produced out of 56 litres of milk.

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A runner covers 10 kilometres in $2\frac{1}{2}$ hours.

Find the distance he covers in 5 hours at the same velocity.

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The price of 15 litres of liquid soap is L.E. 7.5 Find :

(a) The price of 45 litres of the same soap.

(b) Number of litres of price L.E. 11.5

If the price of 4 TV sets is L.E. 5000 , then find :

(a) The price of 3 sets.

(b) If you have L.E. 10 000 , How many TV sets can you buy ?

A tractor ploughs 14 feddans in 3.5 hours. Find :

(a) The number of feddans the tractor ploughs in 4.5 hours.

(b) The time needed to plough 30 feddans.

1 ***Complete each of the following :***

[a] The proportion is ....

[b] $\frac{7}{12} = \frac{2.8}{\dots\dots} = \frac{\dots\dots}{36}$

[c] $0.5\ m^2 : 45\ dm^2 =$ .... : ....

[d] $\frac{1}{4} : \frac{2}{5} : \frac{3}{10} = 5 :$ .... : ....

[e] $\frac{8}{\dots\dots} = \frac{1}{3}$

2 ***A car consumes 12 litres of petrol in 150 km.***

Complete the following proportion table.

Petrol in litre	12	....	36
Distance in km	150	100	....

3 A machine produces 16 units from a certain product in 4 hours , ***what is the rate of the machine ? then how long does this machine take to produce 25 units ?***

....

....

....

....

4 If the ratio of Laila's weight to Farah's weight = $\frac{1}{3}$ and Farah's weight to Fayrouz's weight = 2 : 3 , and Farah's weight is 54 kg. , ***find the weight of Laila and Fayrouz.***

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5 ***Complete the following table to make the corresponding numbers in the two rows proportional :***

1.3	....	1	3	....	5.5	....
....	5	10	....	45	....	6.7

Sheet 7

From unit (1) Lesson (1)
To unit (2) Lesson (2)

1 *Complete :*

[a] The product of the extremes = the product of ....

[b] The fourth proportional term in 3 , 6 and 12 is ....

[c] If a : b = 2 : 3 and b : c = 4 : 5 , then a : c = ... : ....

[d] If 3 , X , 12 and 16 are proportional numbers , then X = ... and it is called the .... term.

[e] If $\frac{5}{9} = \frac{15}{X}$, then X = ...

---

2 *Complete the missing number in each of the following proportions :*

[a] 2 , 11 , 8 , ...

[b] 5 , 8 , ... , 24

[c] 9 , ... , 4.5 , 4

[d] .... , 7 , 24 , 56

---

3 [a] A car consumes 20 litres of fuel to cover a distance of 180 km.

How many litres are needed to cover 540 km.

[b] A machine ploughs 6 feddans in 3 hours , ***find the rate of performance of this machine.*** If another machine ploughs 6 kirats in 10 minutes , ***which of the two machines is better ?***

4 ***Choose the correct answer :***

[a] If $\frac{a+6}{20} = \frac{1}{2}$, then a = ... (6 *or* 4 *or* 3 *or* 10)

[b] If the numbers 2 , 3 , 4 and X are proportional , then the value of X = ... (5 *or* 6 *or* 7 *or* 8)

[c] $\frac{2}{5} = \frac{\dots\dots}{17.5}$ (35 *or* 10 *or* 7 *or* 2.5)

[d] If $\frac{a}{b} = \frac{1}{2}$ and b : c = 4 : 7 , then a : c = ...

(1 : 14 *or* 4 : 7 *or* 3 : 7 *or* 2 : 7)

[e] If 3 a = 4 b , then $\frac{a}{b}$ = ... ($\frac{3}{4}$ *or* $\frac{2}{3}$ *or* $\frac{4}{3}$ *or* $\frac{3}{2}$)

5 A machine produces 1 400 m. of textile in two hours. ***Calculate the needed time to produce 4 900 m. of textile.***

Drawing Scale

The distance between two cities is 25 kilometres. If the distance between them on a map is 5 cm. , find the drawing scale of this map.

A tourist took a photo to Heibs Temple , the height of the temple o this photo was 15 cm. and the real height was 6 metres. Find the drawing scale.

Tarek found that the height of Cairo Tower in a photo is 12 cm. His father told him that the real height is 180 metres. Find the drawing scale of the photo.

The drawing distance between Cairo and Alexandria on a map is 3.5 cm. Find the drawing scale of this map if the real distance is 210 km.

A house is of real height 10.5 m. and its picture height is 0.35 dm.
Find the used drawing scale of this picture.

A magnifying glass is used to magnify an insect of real length 0.4 mm.
If its magnified length is 6 cm. , calculate the ratio of magnification.

A butterfly is of length 3.75 mm.
Find the drawing scale if its photo length is 0.027 m.

Complete the following tables , then calculate the drawing scale in each one :



Drawing length in cm.	4	......
Real length in m.	2.4	6



Drawing length in cm.	5	12.5
Real length in km.	......	75

Ahmed drew a picture of his brother Osama with a drawing scale 1 : 40 If the real height of Osama is 160 cm. , what is his height in the picture ?

The distance between Cairo and El-Ismailia on a map is 16 cm. If the drawing scale of the map is 1 : 750 000, find the real distance between them.

A picture of Cairo Tower was photographed with a scale 1 : 7000 Find the real height of the tower if its height in the picture is 2.7 cm.

A Photo was taken to a natural scene with a drawing scale 1 : 100 If the real height of a tree in the scene is 8 metres, find its height in the photo.

A map was drawn with a scale 1 : 500 000 If the distance between two cities on the map was 14 cm. , find the real distance between these two cities in kilometres.

The drawing scale of a map is 1 : 7 000 000

If the real distance between two cities on this map is 168 km. , find the map distance between these two cities.

An insect is enlarged by a drawing scale 40 : 1 If the real length of the insect is 2.5 mm. ,

find its enlarged length.

A piece of land is in the shape of a square of real perimeter 240 m. What is the side length of it in a drawing with a scale 1 : 200

Complete each of the following :

a The drawing scale = $\frac{\dots\dots}{\dots\dots}$

b If the height of a building is 20 m. , then its height in cm. on a picture of a drawing scale 1 : 100 will be ....

c If the length on drawing is 2 cm. and the real length is 6 metres , then the drawing scale = ... : ....

d If the drawing scale is 1 : 300 and the real length is 60 m. , then the map length equals .... mm.

e If the drawing scale is 1 : 100 and the map length is 5 mm. , then the real length equals .... cm.

f A lens of magnifying percent age 20 : 1 is used to magnify an insect. If the length of the head of this insect is $\frac{1}{2}$ mm. , then its magnified head has a length of .... cm.

g The real length = $\frac{\dots\dots}{\dots\dots}$

h The drawing length = ... × ....

Choose the correct answer :

a The length in a map is 12 cm. and in reality is 7.2 km. , then the drawing scale is .... (1 : 60 ***or*** 1 : 600 ***or*** 1 : 6000 ***or*** 1 : 60 000)

b If the length of a road in drawing is 3 cm. and the real length is 1 500 metres , then the drawing scale will be ....

($\frac{1}{50}$ ***or*** $\frac{1}{500}$ ***or*** $\frac{1}{5\,000}$ ***or*** $\frac{1}{50\,000}$)

c If the real length of an insect is 0.3 mm. and its length after magnification is 4.5 cm. , then the ratio of magnification will be ....

(1 : 15 ***or*** 15 : 1 ***or*** 1 : 150 ***or*** 150 : 1)

d A building of height 90 m. was pictured by a scale 1 : 10 000 , then its height in the picture equals .... cm.

(0.9 ***or*** 9 ***or*** 90 ***or*** 0.09)

The drawing scale of a map is 1 : 5 000 000 , find :

a The map distance if the real distance is 150 km.

b The real distance if the map distance 4.5 cm.

A model for a football playground is drawn with a drawing scale 1 : 500 The dimensions of the playground in the model are 24 cm. and 10 cm. Find :

a The area of this playground in square metres.

b The perimeter of this playground in metres.

Sheet 8

From unit (1) Lesson (1)
To unit (2) Lesson (3)

1 *Complete :*

[a] The drawing scale = $\frac{\dots\dots}{\dots\dots}$

[b] If the drawing scale is 1 : 300 , and the length on drawing is 2 cm. , then the length in reality = ... metres.

[c] If the drawing length of an object is 3 cm. and its real length is 30 metres , then the drawing scale is ....

[d] The ratio $\frac{5}{13}$, its first term is .... and its second term is ....

[e] If the drawing scale less than 1 , then it refers to ....

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2 [a] The distance between two cities is 20 km. , if the distance between them on a map is 4 cm. ***find the drawing scale of this map and what does it mean.***

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....

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[b] The real length of an insect is 0.4 mm. and its length under a microscope is 2 cm. , ***find the ratio of magnification.***

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3 ***Cairo tower is one of the tourists places of Cairo , its height is 187.2 m. , if its height in a picture is 13 cm.*** Find the drawing scale.

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4 [a] The ratio of the production of three factories for TV sets is 3 : 2 : 1 , if the sum of their production is 9 600 ***Find the production of each one.***

[b] An engineer drew a map of a rectangular garden with a scale 1 : 3 000 ***Find the real area of this garden if its dimensions on the map are 3.6 cm. and 2 cm.***

5 [a] The real distance between Cairo and Alexandria is 220 km. , ***find the distance between them on a map drawn with a scale 1 : 500 000***

[b] A magnified picture of an insect was photographed by a scale 200 : 1 ***find the length of the insect in the picture if its real length is 0.14 mm.***

Exercise 4

Proportional Division

Distribute L.E. 150 between Usama and his sister in the ratio 3 : 2

The age of Sameh is $\frac{3}{7}$ the age of Adel.

Find the age of each if the sum of their ages is 30 **years.**

A piece of building land was Distribute between two brothers in the ratio 7 : 5. If the share of the first exceeds the share of the second by 80 square metres. Find the area of the land and the share of each of the first and the second.

Distribute L.E. 240 among A , B and C in the ratio 7 : 4 : 5

Distribute 54 booklets among 3 students in the ratio 2 : 3 : 4.

In a primary school , the ratio among the number of pupils in grade three , four and five is 7 : 4 : 5 If the number of the pupils in grade three is 280 pupils , find the number of the pupils in grade four and grade five.

A sum of L.E. 660 was divided among Kamel , Ahmed and Mohamed. If Ahmed's share was $\frac{1}{2}$ Kamel's and Mohamed's share was $\frac{2}{3}$ Ahmed's , find **a** The ratio of division. **b** The share of each.

A box contains 260 coloured balls , some of them are white , some are red and the rest are green. If the number of the white balls is equal to $\frac{7}{8}$ of those of the green balls and the number of the red balls is equal to $\frac{5}{6}$ of those of the green balls. Find the number of the white , the red and the green balls.

A man died leaving a capital of L.E. 24 000 to be distributed among his wife , 2 sons and 3 daughters such that the wife took $\frac{1}{8}$ of the capital and the son took twice of what the girl took.
Find the share of the wife , each of his sons and each of his daughters.

An amount of L.E. 2 100 was distributed among 3 persons such that the share of the first is half the share of the second , and the share of the second is half the share of the third. Find the share of each person.

Waleed and Iman paid L.E. 12 000 and L.E. 15 000 to start a clothes shop. They made a net profit L.E. 2 700 after one year.
Find the share that each partner should take.

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Youssef and Shireen started a laundry. Shireen paid L.E. 20 000 and Youssef paid L.E. 25 000 at the end of the year, the net profit was L.E. 6 300 Calculate each partner's share of the profit.

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Emad , Noran and Ramez started to build a school. They paid L.E. 144 000 , where Emad paid L.E. 36 000 , Noran paid L.E. 48 000 and Ramez paid the rest. At the end of the year , Ramez's share was L.E. 4 800 Find the share of each of Emad and Noran.

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Siham , Sherief and Magdy started a business, Siham paid L.E. 5000, Sherief paid L.E. 3000 and Magdy paid L.E. 4 000 At the end of the year , the sum of the shares of Sherief and Magdy was L.E. 1 610

Find the share of each one.

Three persons set up a commercial business for flowers. The first paid L.E. 6 000 , the second paid L.E. 4 800 and the third paid L.E. 7 200. At the end of the year , the profit of the first was L.E. 240 more than that of the second. Find the profit of each of the second and the third.

Three persons set up a commercial business. The first paid $\frac{3}{4}$ of what the second paid , the second paid $\frac{2}{3}$ of what the third paid at the end of the year , the profit became L.E. 6 240 Calculate the share of each of them from profit.



Sheet 9

From unit (1) Lesson (1)
To unit (2) Lesson (4)

1 [a] Distribute L.E. 360 among three persons in the ratio 5 : 3 : 4

[b] The difference between two numbers is 12 and the ratio between them is 5 : 7 ***find the two numbers.***

2 Three persons participated in a commercial , the first paid L.E. 15 000 , the second paid L.E. 25 000 and the third paid L.E. 20 000 At the end of the year , the profit was L.E. 5 520 ***Find the share of each of them.***

3 [a] A map is drawn with a scale 1 : 1 000 000 find the real distance between El-Fayoum and Beni Suef in kilometres if the map distance is 5 cm.

[b] If the ratio of the production of 3 factories for a certain type of washing machine is 5 : 4 : 3 , and the production of the second and the third factories together is 9 100 ***Find the production of the first factory.***

4 A father distributed 9 000 pounds among his three sons if the share of the first was third of the money and the ratio between the share of the second and the share of the third is 2 : 3 ***Calculate the share of each of them.***

5 A man died leaving 192 feddans of land to be distributed among his wife , 2 sons and 3 daughters , the share of the wife is $\frac{1}{8}$ of the whole land , and the share of the son is twice that of the daughter. ***Find the share of the wife and the share of each son and daughter.***

Exercise 5

Percentage

Convert each of the following to a percentage :

a $\frac{5}{8}$ ....

b $\frac{9}{20}$ ....

c $\frac{3}{5}$ ....

d $\frac{18}{45}$ ....

e $\frac{13}{25}$ ....

f $\frac{13}{200}$ ....

Convert each of the following to a percentage :

a 0.4 ....

b 0.405 ....

c 0.06 ....

d 0.45 ....

e 0.0375 ....

f 0.475 ....

Simplify each of the following ratios , then convert each one to a percentage :

a 2.5 : 5

b 51 : 85

c 2.8 : $3\frac{1}{2}$

d 23 cm. : 20 cm.

e 15 months : $1\frac{1}{2}$ years

Convert each of the following to a fraction :

a) 2% ……………

b) 30% ……………

c) 250% ……………

d) 36% ……………

e) $7\frac{1}{2}\%$ ……………

f) 37.5% ……………

Convert each of the following to a decimal :

a) 5.6% ……………

b) $8\frac{2}{5}\%$ ……………

c) 0.02% ……………

d) $9\frac{3}{4}\%$ ……………

e) $12\frac{1}{8}\%$ ……………

f) 24.8% ……………

Complete each of the following :

a) 23% of 300 = ……………

b) 45% of 200 = ……………

c) 30% of L.E. 50 = ……………

d) $6\frac{1}{4}\%$ of 400 kg. = ……………

e) 2.25% of 500 = ……………

f) 25% of 3000 gm. = ……………

g) 60% of L.E. 610 = ……………

h) 1% of 600 = ……………

Complete each of the following :

a $\frac{4}{25}$ = ... %

b 0.625 = ... %

c 76% = $\frac{......}{......}$

d 36% + 24% – 17% = ...

e 28% + 52% + ... = 1

f 15% + 0.35 + $\frac{1}{2}$ = ... %

g 90% – $\left(\frac{1}{2} + 20\% + 0.15\right)$ = ... %

h 0.35 + $\frac{9}{20}$ = ... %

i 2.5 + ... = 100%

j $\frac{3}{7} \times \frac{7}{3}$ = ... %

k 225% – $1\frac{1}{4}$ = ...

l 3 – 25% = ...

m 1 – (35% + 47%) = ...

n 15% – 0.15 = ...

o 1 – $\frac{3}{4}$ = ... %

p 50% – $\frac{1}{5}$ = ... %

q If the percentage of absent students is 8% , then the percentage of attendees is .... %

r If the percentage of the number of girls in a mixed class is 46% , then the percentage of the number of boys is ....

s 400 pounds was invested. If it becomes L.E. 800 , then the percentage of the increase will be .... %

t $\frac{1}{2}$: 1 = ... %

Find the value of x in each of the following :

a $\frac{x}{9}$ = 15% ....

b $\frac{x}{5}$ = 150% ....

c $\frac{x-2}{100}$ = 25% ....

d $\frac{2}{x+8}$ = 5% ....

e $\frac{3x}{2}$ = 75% ....

Choose the correct answer between brackets :

a $\frac{7}{25}$ = ... % (7 *or* 25 *or* 28 *or* 32)

b 50% = ... ($\frac{1}{4}$ *or* 0.5 *or* 5 *or* 50)

c 1 – 25% = ... ($\frac{3}{4}$ *or* $\frac{1}{4}$ *or* $\frac{1}{8}$ *or* $\frac{3}{8}$)

d 30% + 40% = ... (70 *or* 7 *or* 0.7 *or* 0.07)

e $87\frac{1}{2}$% = ... ($\frac{1}{8}$ *or* $\frac{3}{8}$ *or* $\frac{5}{8}$ *or* $\frac{7}{8}$)

f 100% of the number 25 = ... (100 *or* 125 *or* 25 *or* 0.25)

g L.E. 1.5 : P.T. 120 = ... % (1.25 *or* 12.5 *or* 25 *or* 125)

h 45% of a kilogram = ... gm. (450 *or* 4500 *or* 45 *or* 0.45)

i 30% of L.E. 700 = L.E. ...... (370 *or* 300 *or* 210 *or* 21)

j 8 ÷ 8 = ... % (1 *or* 0.1 *or* 0.01 *or* 100)

k 75% of 100 = 25% of ...... (100 *or* 200 *or* 300 *or* 400)

l A dress has a sign saying that it is made of cloth with 55% cotton , 15% wool and the remaining is synthetic. The percentage of the synthetic = ... % (25 *or* 20 *or* 30 *or* 35)

m If 12% of a number is 180 , then this number will be ......

(1 250 *or* 1 500 *or* 1 005 *or* 1 205)

There are 750 pupils in a school. 15 pupils were absent one day. Find the percentage of absentees on that day.

....

A basket contains 32 oranges and 18 apples. Find the percentage of oranges in this basket.

....

In a school , there were 600 pupils. On a day , 42 pupils were absent. Find the percentage of those who came that day.

....

....

A factory produces 25 000 lamps weekly. 135 of them are defective. Find the percentage of good lamps approximated to one decimal place.

....

....

Magid bought a T-shirt , labelled on a small card on it (made of cotton and synthetic). The percentage of the synthetic is 40% only. Calculate the percentage of cotton , then find the equivalent fraction to each percentage.

....

....

Essam has a T-shirt made of cotton , wool and synthetic. If the wool is 15% of this T-shirt and 30% of it is synthetic , then find the percentage of cotton.

....

....

In a school trip , 12 pupils from 35 pupils in a class have participated. Find the percentage of the participants.

....

....

Hassan ate 3 pieces of gateaux from a box containing 24 pieces of gateaux in a party of his birthday. And he distributed 6 pieces on his family. Calculate the percentage of the number of pieces that Hassan ate and the percentage of the number of pieces eaten by his family.

....

....

If the percentage of the succeeded pupils in an exam in Arabic in sixth grade in a school is 85% , calculate the percentage of failure, then write each of the percentage of succeeded pupils and failure in the form of a common fraction in its simplest form.

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If the percentage of the number of girls in a class which is mixed is 67% , find the percentage of the number of boys in this class.

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Wael bought a car for L.E. 6000 , he paid 30% of its price.
How much did he pay ?

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650 pupils were tested in an examination , 86% of them succeeded.
Find the number of pupils who failed.

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The percentage of absent pupils in a primary school one day was 4.5%
If the number of absent pupils was 36 pupils , find the whole number of pupils in this school.

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A road is 520 km. was paved in 3 months. If 45% of it was paved in the first month and 25% of it was paved in the second month , find how many kilometres were paved in the third month.

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Complete each of the following :

a $\frac{25}{32}\% = \frac{1}{\cdots\cdots}$ **b** $\frac{3}{4}\% = \frac{3}{\cdots\cdots}$

c 45% – 0.45 = ……… **d** 45% – 0.045 = ………

e 25% of an hour = ……… minutes.

f The percentage of 6 hours : $\frac{3}{4}$ day is ……… %

g A road is 150 km. long. If 30% of its length is paved , so the part that is not paved is ……… km.

Wael bought a car for L.E. 6000 , he paid 30% of its price. How much did he pay ?

....

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Sheet 10

From unit (1) Lesson (1)
To unit (2) Lesson (5)

1 *Complete :*

[a] The percentage is ....

[b] $\frac{6}{25}$ = ... %

[c] If 45 % of a number = 162 , then the number is ....

[d] 1 – (35 % + 20 %) = ... %

[e] 70 % = ... (in a fractional form)

2 *Convert each of the following into a percentage :*

[a] 0.07 ....

[b] $\frac{3}{5}$ ....

[c] $\frac{9}{20}$ ....

[d] 0.6 ....

3 If : $\frac{X}{40}$ = 35 % , *find the value of* X

....

4 [a] In a class , there are 48 pupils , if 6 of them are absent.

Find the percentage of absentees and also the percentage of attendance.

....

[b] An amount of money was distributed among Heba , Hend and Nada in the ratio 2 : 3 : 4 If Nada's share is L.E.15 more than Heba's share.

Find the total amount of the money.

5 **[a]** The monthly salary of an employee is L.E. 936 He saved L.E. 117

Find the percentage of what he saved to its salary.

[b] The real distance between Cairo and Banha is 40 km. and the distance between them on the map is 8 cm.

Find the drawing scale for this map.

Applications on the percentage

A shopkeeper bought some goods for L.E. 4 800 and sold them for L.E. 5 400. Find his percentage of profit.

A shopkeeper bought some goods for L.E. 642.5 and sold them for L.E. 594.3125 Find his percentage of loss.

A shopkeeper bought some goods for L.E. 4 500. He spent L.E. 500 to transport them. He sold these goods for L.E. 6 250
Find his percentage of profit.

A man bought an old house for L.E. 225 000. He spent L.E. 45 000 to repair it. He sold it for L.E. 240 000. Find his percentage of loss.

A dealer bought a TV set for L.E. 960 and he paid L.E. 20 to transfer it. If he sold it for L.E. 1 176 , find the percentage of the profit.

A man bought a car for L.E. 39 400. Find the selling price if the percentage of the profit is 8%

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A man sold a washing machine for L.E. 3 192. Find the price which the man bought it for if his percentage of profit is 14%

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A company for selling the electric sets. It sells TV. for L.E. 2100. If the percentage of the profit is 12 % , find the buying price of TV.

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Khaled bought a flat for L.E. 150 000. After selling it , he found that the percentage of his loss was 5%. Calculate the selling price of the flat.

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A man bought a steam bicycle for L.E. 2 750 and spent L.E. 250 to repair it. Find the selling price if his percentage of profit is 15%

A man bought a boat for L.E. 5480 and spent L.E. 1 020 to repair it. Find the selling price if his percentage of loss is 6%

A man bought a house and spent L.E. 22 400 to repair it. He sold it for L.E. 92 000
If his percentage of profit is 15% , then find the buying price.

The marked price of a television set is L.E. 2500. It has been sold after discount for L.E. 2350. Find the discount percentage.

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A lady paid L.E. 255 to buy a white dress after 15% discount of the marked price. Find the cost of the dress before the discount.

....

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Nahed bought an automatic washing machine for L.E. 3600 and the discount was 10%. Calculate the original price of the washing machine before discount.

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The price of an electric mixer is L.E. 180. If the discount is 10% of its original price, find its price after discount.

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Hend deposited L.E. 2 000 in a bank with an interest of 8% in the year. Find the profit that Hend got at the end of one year.

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A piece of cloth , 20 metres long , is put in water. It shrunk by 4% from its original length. What is the length after shrinking ?

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....

Choose the correct answer between brackets :

a An employee's salary is L.E. 500. He saves 10% of it , then he saves L.E. ...... (50 *or* 5 *or* 10 *or* 55)

b If 25% of a piece of cloth equals 250 cm. , then the length of the whole cloth = ... cm. (450 *or* 1000 *or* 500 *or* 10 000)

c The price of some goods is L.E. 3 000. If they are sold for L.E. 2500 , then the percentage of loss is ...... % ($16\frac{2}{3}$ *or* 20 *or* 30 *or* $\frac{1}{6}$)

d If a merchant bought a TV set for L.E. 1 000 and sold it for L.E. 1200 , then the percentage of profit is ...... % (20 *or* 30 *or* 15 *or* 40)

e If a man bought a car for L.E. 40 000 and sold it with 5% profit from its cost price , then the selling price of the car would be L.E. ......

(41 000 *or* 42 000 *or* 45 000 *or* 46 000)

f If the price of a pair of shoes is L.E. 100 and there is a discount of 20% on it , then the discount will be L.E. ... (25 *or* 40 *or* 20 *or* 45)

g A merchant sold goods for L.E. 550 with a profit percentage of 10% , then the cost price of goods = L.E. ...... (605 *or* 500 *or* 55 *or* 540)

Sheet 11

From unit (1) Lesson (1)
To unit (2) Lesson (6)

1 ***Choose the correct answer between brackets :***

[a] $50\% + \frac{1}{5} = ... \%$ (55 *or* 70 *or* 45 *or* 10)

[b] If 9 , X , 24 and 32 are proportional quantities , then X = ...
(12 *or* 15 *or* 3 *or* 6)

[c] 45 % of 300 pounds = ... pounds (45 *or* 35 *or* 150 *or* 135)

[d] If a merchant bought a TV set for L.E. 1 000 , then sold it for L.E. 1 200 , then the percentage of profit is .... % (20 *or* 30 *or* 15 *or* 45)

[e] Khaled bought a car in the price L.E. 60 000 and he sold it with profit 5 % , then the selling price of the car is L.E. ....
(61 000 *or* 62 000 *or* 63 000 *or* 65 000)

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2 [a] A trader sold goods for L.E. 550 with a profit of 10 %
Find the cost price of the goods.

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[b] A piece of cloth of 10 metres long is put in water , it shrank by 5 % from its original length. ***Find its length after shrinking.***

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3 [a] The length of a road is 120 km. , it is wanted to pave the road in three months. If 42 % in the first month and 28% in the second month.

How many kilometres will be paved in the third month ?

[b] Ramy deposited L.E. 3 000 in a bank with an interest 11%

Find the total amount after one year.

4 [a] The price of a TV set is L.E. 1 450 , in the sale , its price becomes L.E. 1 160

Find the percentage of the discount.

[b] XYZ is a triangle in which XY : YZ : ZX = 4 : 5 : 7

and ZX = 28 cm. ***Find the perimeter of the triangle.***

5 A trader bought some goods for L.E. 960 and spent L.E. 20 for transportation, then he sold it with profit 20 %

Find the selling price.

UNIT 3

Geometry and measurement

The relation between the geometrical shapes

Complete the following

- The four sides are equal in length in each of ....
  and ....
- The two diagonals are equal in length in each of ....
  and ....
- The two diagonals are perpendicular in each of ....
  and ....
- The four angles are right in each of ....
  and ....
- The opposite angles are equal in measure in each of ....
  .... , ... and ....
- The two diagonals bisect each other in each of ....
  .... , ... and ....
- The sum of measures of the two consecutive angles equals 180° in each of .... , ... , ... and ....

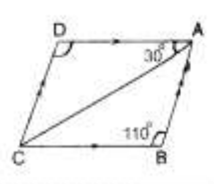
The opposite figure shows a parallelogram :

in which : m (∠ B) = 110°

and m (∠ DAC) = 30°

Find : m (∠ D) , m (∠ BAC)

and m (∠ ACD)



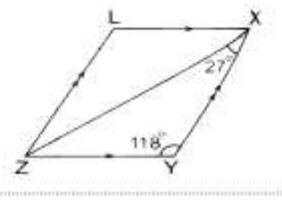
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In the opposite figure :

XYZL is a parallelogram in which :

m (∠ Y) = 118° and m (∠ YXZ) = 27°

Find : m (∠ L) and m (∠ LXZ)

....

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....

In the opposite figure :

ABCD is a parallelogram in which :

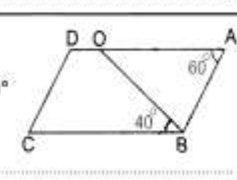
m (∠ B) = 120° and $\overline{DH} \perp \overline{BC}$ **Find :** m (∠ HDC)

....

....

....

In the opposite figure :



ABCD is a parallelogram in which : m (∠ A) = 60°

, m (∠ OBC) = 40° **Find :** m (∠ ABO)

....

....

....

ABCD is a trapezium in which : m (∠ B) = 90° , AD = 7 cm. , AB = 4 cm.

BC = 10 cm. and DC = 5 cm. Locate the point X on $\overline{BC}$ for the figure ABXD is a rectangle , in this case complete :

• AB = ... = ... cm.

• AD = ... = ... cm.

• The perimeter of the rest of the figure = ... cm.

Choose the correct answer from the given ones :

1 The two diagonals of a rectangle are ....

[a] perpendicular. [b] equal in length.

[c] perpendicular and equal in length. [d] parallel.

2 The two diagonals of a square are ....

[a] just perpendicular. [b] just equal in length.

[c] perpendicular and equal in length.

[d] not equal in length and not perpendicular.

3 The parallelogram in which one angle is a right angle is called ....

[a] a square. [b] a rectangle.

[c] a trapezium. [d] a rhombus.

4 The parallelogram in which one angle is a right angle and two adjacent sides are equal in length is called ....

[a] a square. [b] a rectangle.

[c] a trapezium. [d] a rhombus.

5 The parallelogram in which two adjacent sides are equal in length is called ....

[a] a square. [b] a rectangle.

[c] a trapezium. [d] a rhombus.

6 The rhombus whose one of its angles is right is called ....

[a] a rectangle. [b] a square. [c] a trapezium.

7 The rectangle whose two adjacent sides are equal in length is called ....

[a] a rhombus. [b] a trapezium. [c] a square.

8 The rhombus whose diagonals are equal in lengths is called ....

[a] a square. [b] a rectangle. [c] a trapezium.

9 The rectangle whose diagonals are perpendicular is called ....

[a] a trapezium. [b] a square. [c] a rhombus.

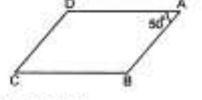
Sheet 12

From unit (1) Lesson (1)
To unit (3) Lesson (1)

1 ***Complete each of the following :***

[a] The two diagonals are equal in .... and ....

[b] **In the opposite figure :**



ABCD is a parallelogram , (∠ A) = 50°
, the m (∠ B) = ... °

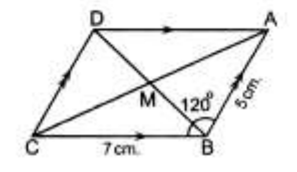
[c] The rhombus is a parallelogram in which two adjacent sides are ....

[d] A parallelogram in which its diagonals are perpendicular and not equal in length called. ....

[e] The shape that the two diagonals are perpendicular and equal in length is ....

---

2 ***In the opposite figure :***



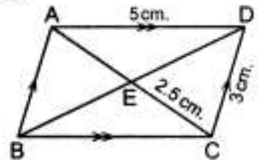
ABCD is a parallelogram in which
AB = 5 cm. , BC = 7 cm. ,
m (∠ ABC) = 120°
Without using geometrical instruments
Find : m (∠ ADC) , ...

the length of $\overline{DC}$ ....

and the length of $\overline{AD}$ ....

---

3 ***In the opposite figure :***



ABCD is a parallelogram in which : CD = 3 cm.
, EC = 2.5 cm. , AD = 5 cm.
Find The length of each of :

AB ....

, BC ....

and AC ....

4 **[a]** A map is drawn for the Suez Canal with a scale 1 : 500 000 , if the length of the canal on the map is 34.6 cm.

Calculate its real length in kilometres.

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[b] ***In the opposite figure :***

A parallelogram in which , m (∠ BAD) = 53° ,

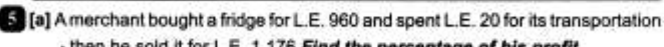
m (∠ DBC) = 45° , AM = 6 cm.

Calculate without using measuring tools each of :

(1) m (∠ ABD) ....

(2) m (∠ ADC) ....

(3) AC ....



5 **[a]** A merchant bought a fridge for L.E. 960 and spent L.E. 20 for its transportation , then he sold it for L.E. 1 176 ***Find the percentage of his profit.***

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The visual pattern

Discover the pattern in each case of the following and describe it then complete its repetition twice :

[a] !! ?? !! ?? ....

[b] ....

[c] ....

[d] ....

[e] ....

[f] ....

[g] ....

Discover the rule and find the next two shapes in the following :

[a] ....

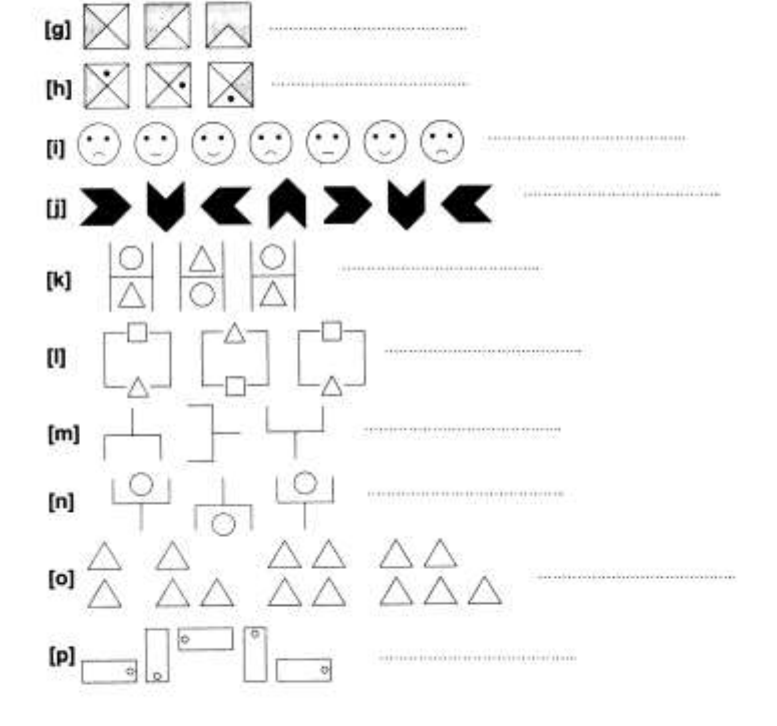
[b] ....

[c] ....

[d] ....

[e] ....

[f] ....


[g]
[h]
[i]
[j]
[k]
[l]
[m]
[n]
[o]
[p]

Volumes

Complete :

a The solid is ....

....

b The cuboid has .... faces , each face is a .... and each two opposite faces are .... in area.

c The cube has .... faces , each face is a .... and they are all equal in ....

d The number of edges of the cuboid is ....

e The number of vertices of the cube is ....

f The edges of the cube are all ....in length.

g The number of edges of the cube is ....

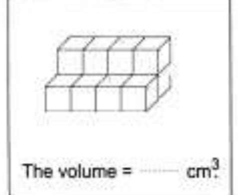
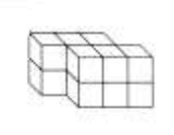
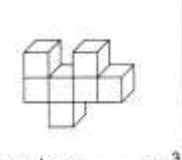
h The number of units a solid consists of is called the .... of the solid.

i The line segment resulted from intersection of two faces is called ....

j The cubic centimetre is ....

k The cubic decimetre is ....

Find the volume of the following solids and consider the measuring unit of volume ( ) is cm^3

		
The volume = ... cm^3	The volume = ... cm^3	The volume = ... cm^3

Complete :

a $13 \text{ m}^3 =$ .... $=$ .... dm^3

b $120 \text{ dm}^3 =$ .... $=$ .... cm^3

c $6\,500 \text{ dm}^3 =$ .... $=$ .... m^3

d $8\,200 \text{ mm}^3 =$ .... $=$ .... cm^3

e $75 \text{ cm}^3 =$ .... $=$ .... mm^3

f $4\,300 \text{ cm}^3 =$ .... $=$ .... dm^3

g $3 \text{ m}^3 =$ .... $=$ .... mm^3

h $0.07 \text{ dm}^3 =$ .... $=$ .... mm^3

i $3\,870 \text{ mm}^3 =$ .... $=$ .... cm^3

j $2.1 \text{ cm}^3 =$ .... $=$ .... mm^3

k $3\,000\,000 \text{ mm}^3 =$ .... $=$ .... m^3

l $2\,580\,000 \text{ mm}^3 =$ .... $=$ .... m^3

m $0.05 \text{ cm}^3 =$ .... $=$ .... mm^3

Choose the correct answer :

a The number of vertices of the cuboid is .... (8 *or* 12 *or* 6 *or* 4)

b The number of edges of the cube is .... (6 *or* 8 *or* 12 *or* 4)

c The number of faces of the cuboid is .... (6 *or* 8 *or* 12 *or* 4)

d The number of faces of the cube - shaped box without a lid is ....
(6 *or* 8 *or* 5 *or* 4)

e $1 \text{ dm}^3 =$ .... cm^3 (10 *or* 100 *or* 1 000 *or* 10 000)

f $10 \text{ cm}^3 =$ .... dm^3 (0.1 *or* 0.01 *or* 0.001 *or* 10)

g $5 \text{ cm}^3 =$ .... dm^3 (0.5 *or* 5 000 *or* 0.005 *or* 500)

h $1 \text{ cm}^3 =$ .... dm^3 (1 *or* 10 *or* 1000 *or* $\frac{1}{1\,000}$)

i $12 \text{ cm}^3 =$ .... mm^3 (0.012 *or* 120 *or* 1 200 *or* 12 000)

j $1.3 \text{ m}^3 =$ .... dm^3 (0.13 *or* 0.013 *or* 1 300 *or* 0.00013)

k $200\,000 \text{ mm}^3 =$ .... m^3 (2 *or* 0.2 *or* 200 *or* 0.0002)

Sheet (14) From unit (1) Lesson (1) To unit (3) Lesson (3)

1 ***Find the volume of each of the following figures considering the unit of volume is cm^3 :***

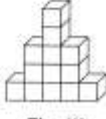


Fig. (1)

The volume = ... cm^3

Fig. (2)

The volume = ... cm^3

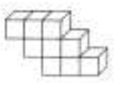


Fig. (3)

The volume = ... cm^3

2 ***Complete each of the following :***

[a] In the cuboid , each two opposite faces are .... and ....

[b] In the cube , there are .... edges and .... vertices.

[c] $17 \ m^3$ = ... dm^3

[d] If the dimensions of a cuboid are equal in length , then it is called ....

[e] The cubic centimetre is ....

3 ***Choose the correct answer between brackets :***

[a] If the numbers 2 , 3 , 4 and X are proportional , then X = ... (8 *or* 12 *or* 6 *or* 9)

[b] Each of cube and cuboid has .... faces. (8 *or* 12 *or* 6 *or* 4)

[c] $3\,250 \ mm^3$ = ... cm^3 (3.25 *or* 32.5 *or* 0.325 *or* 325)

[d] $7 \ dm^3$ = ... cm^3 (0.007 *or* 7 000 *or* 700 *or* 70)

[e] In the cube , all the edges are ....

(different in length *or* equal in length *or* parallel *or* intersecting)

4 **[a]** The ratio between the number of boys and the number of girls in a school is 5 : 3 , if the number of boys is 200 ***Find the number of girls.***

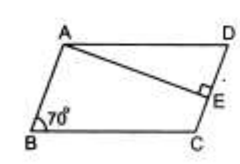
[b] The price of a radio is L.E. 180 There is a discount 10%
Find its price after discount.

5 [a] *Arrange each of the following ascendingly :*
5 m^3 , $500\,000 \text{ cm}^3$ and 50 dm^3

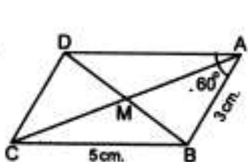
[b] The distance between Luxor and Qena is 60 km. If the distance between them on a map is 6 cm. *Find the drawing scale of this map.*

In the opposite figure :
ABCD is a parallelogram in which :
m (∠ B) = 70° and $\overline{AE} \perp \overline{CD}$

Find : m (∠ EAD)



[b] *In the opposite figure :*
ABCD is a parallelogram which has AB = 3 cm.
, BC = 5 cm. , m (∠ BAD) = 60°
(1) *Find :* m (∠ ABC)
(2) *Calculate :* AD + DC



The volume of the cuboid

Complete :

a The volume of the cuboid = ... × .... × ....

b The height of a cuboid = $\frac{\text{............}}{\text{............}}$

c The volume of a cuboid = ... × the height.

d A cuboid is with dimensions 6 cm. , 8 cm. and 10 cm. , then its volume is .... cm^3

e A room is in the shape of a cuboid and its dimensions are 5 m. , 4 m. and 3 m. , so the volume of this room is .... m^3

f If the volume of a cuboid is 160 dm^3 and its height is 5 dm. , then its base area is .... dm^2

g If the base area of a cuboid is 48 cm^2 and its volume is 192 cm^3 , then its height is ....

h The length of a cuboid shape is 8 cm. , its width is .... if its height is 5 cm. and its volume is 240 cm^3

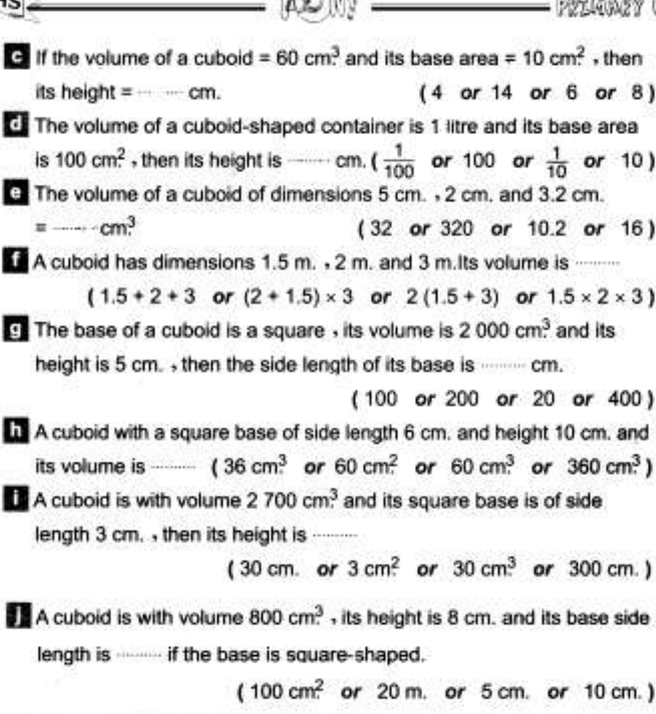
i The area of a rectangular base of a cuboid whose volume is 245 cm^3 and its height is 35 cm. is ....

j The volume of a cuboid with base area 160 cm^2 and height 10 cm. is ....

Choose the correct answer :

a The volume of the cuboid of dimensions 4 cm. , 5 cm. , 6 cm. is .... cm^3 (88 *or* 15 *or* 120 *or* 200)

b If the volume of a cuboid is 1 800 cm^3 , and the dimensions of its base are 30 cm. and 10 cm. , then its height = ... cm.



c If the volume of a cuboid = 60 cm^3 and its base area = 10 cm^2, then its height = ... cm. (4 *or* 14 *or* 6 *or* 8)

d The volume of a cuboid-shaped container is 1 litre and its base area is 100 cm^2, then its height is .... cm. ($\frac{1}{100}$ *or* 100 *or* $\frac{1}{10}$ *or* 10)

e The volume of a cuboid of dimensions 5 cm., 2 cm. and 3.2 cm. = ... cm^3 (32 *or* 320 *or* 10.2 *or* 16)

f A cuboid has dimensions 1.5 m., 2 m. and 3 m. Its volume is ....
($1.5 + 2 + 3$ *or* $(2 + 1.5) \times 3$ *or* $2 (1.5 + 3)$ *or* $1.5 \times 2 \times 3$)

g The base of a cuboid is a square, its volume is 2 000 cm^3 and its height is 5 cm., then the side length of its base is .... cm.
(100 *or* 200 *or* 20 *or* 400)

h A cuboid with a square base of side length 6 cm. and height 10 cm. and its volume is .... (36 cm^3 *or* 60 cm^2 *or* 60 cm^3 *or* 360 cm^3)

i A cuboid is with volume 2 700 cm^3 and its square base is of side length 3 cm., then its height is ....
(30 cm. *or* 3 cm^2 *or* 30 cm^3 *or* 300 cm.)

j A cuboid is with volume 800 cm^3, its height is 8 cm. and its base side length is .... if the base is square-shaped.
(100 cm^2 *or* 20 m. *or* 5 cm. *or* 10 cm.)

Find the volume of a cuboid with dimensions 2.5 m., 5 m. and 4 m.

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Find the volume of a cuboid if the area of its base is 12 m^2 and its height equals 3 m.

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How many cubic centimetres are needed to construct a cuboid of dimensions 6.5 cm. , 13 cm and 9 cm. ?

How many cm^3 are enough to form a cuboid of dimensions 17 cm. , 13 cm. and 11 cm.?

Which is greater in volume , a cuboid of dimensions 50 cm. , 35 cm. and 40 cm. or a cuboid of base area 4 200 cm^2 and height 25 cm.?

Which is greater in volume , a cuboid of dimensions 70 cm. , 50 cm. and 30 cm. or a cuboid whose base area = 2 925 cm^2 and its height = 35 cm.?

Calculate the base area of a cuboid of volume 1 029 cm^3 and height 7 cm.

Calculate the base area of a cuboid of volume 1 344 cm^3 and height 24 cm.

A juice case is in the shape of cuboid , its base is square-shaped of side length 6 cm. and its height is 15 cm. Calculate the volume of juice which fills the case completely.

A builder used 2 000 bricks for building up a wall. If each brick is in the shape of a cuboid of dimensions : 25 , 12 and 6 centimetres , calculate the volume of the wall in m^3.

A cuboid-shaped box of dimensions 10 cm. , 12 cm. and 18 cm. was filled with pieces of sweets , each piece is in the shape of a cuboid of dimensions 1 cm. , 2 cm. and 3 cm. Find the number of the pieces that filled the box.

A sweet case is in the shape of a cuboid and its internal dimensions are 21 , 18 and 6 cm. It is wanted to fill it with pieces of chocolate , each of them is a cuboid of dimensions 3 cm. , 3 cm. and 1 cm. Calculate the number of pieces of chocolate which fill the case completely.

A truck for transporting goods، its dimensions are 3 ، 1.5 and 2 metres. It is wanted to fill it with carton boxes for mineral water bottles to distribute it among the commercial shops. The dimensions of one carton box are 40 ، 25 and 25 cm. Calculate:

(a) The greatest number of carton boxes that can be carried by the truck.

(b) The cost of transportation if the cost of transporting one carton is 0.75 pounds.

A lorry for transporting building materials ، the internal dimensions of the container are 5 m. ، 1.8 m. and 0.6 m. It is wanted to fill it completely by bricks of dimension 25 cm. ، 12 cm. and 6 cm. Calculate :

(a) The greatest number of bricks that can be put in the container of the lorry.

(b) The cost of transporting the bricks if the cost of transporting 1000 bricks is 35 pounds.

A swimming pool with internal dimensions 30 , 15 and 2 metres.
405 metres cube of water are poured into it Find :

(a) The height of water in the swimming pool.

(b) The volume of water which is needed to fill the swimming pool completely.

The sum of all dimensions of a cuboid is 48 cm. and the ratio among the lengths of its dimensions is 5 : 4 : 3 Find its volume.

The base of cuboid is a rectangle whose perimeter = 40 cm. and the ratio between its length to its width = 3 : 2
Calculate its volume if its height is 10 cm.

A carton box is with internal dimensions are 50 , 40 and 30 cm.
It is wanted to fill it with boxes of tea in the shape of cuboids , the dimensions of each box are 7 cm. , 5 cm. and 12 cm.
Calculate the greatest number of tea boxes can be put in that box.

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Sheet (15)

From unit (1) Lesson (1)
To unit (3) Lesson (4)

1 ***Complete each of the following :***

[a] The volume of the cuboid = ... × height

[b] The volume of the cuboid whose dimensions are 5 cm. , 6 cm. and 8 cm. is .... cm^3

[c] If the volume of a cuboid is 36 cm^3 and its base area is 12 cm^2 , then its height = ... cm.

[d] The base area of the cuboid = $\frac{\text{........}}{\text{........}}$

[e] The volume of the cuboid = ... × .... × ....

2 [a] ***Which is greater in volume*** , a cuboid of dimensions 24 cm. , 36 cm. and 50 cm. or a cuboid of base area 88 cm^2 and height 45 cm. ?

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[b] A cuboid-shaped box of dimensions 10 cm. , 12 cm. and 18 cm. was filled with pieces of sweets , each piece in the shape of a cuboid of dimensions 1 cm. , 2 cm. and 3 cm. ***Find the number of the pieces that filled the box.***

3 ***Choose the correct answer between brackets :***

[a] The volume of cuboid whose dimensions are 20 cm. , 30 cm. and 40 cm. = ……… cm^3 (2 400 ***or*** 9 000 ***or*** 24 000 ***or*** 90)

[b] If the volume of a cuboid is 1 800 cm^3 and its base dimensions are 30 cm. and 10 cm. , then its height = ……… cm. (9 ***or*** 6 ***or*** 12 ***or*** 15)

[c] The number of faces of the cuboid is ……… (4 ***or*** 6 ***or*** 12 ***or*** 8)

[d] If a cuboid of volume 72 cm^3 , its height is 6 cm. and its length is 4 cm. , then its width = ……… cm. (12 ***or*** 9 ***or*** 6 ***or*** 3)

[e] Cubic decimetre is a unit for measuring ……… (length ***or*** volume ***or*** weight ***or*** area)

4 [a] The sum of dimensions of a cuboid is 240 cm. and the ratio among them is 2 : 3 : 5 ***Find its volume.***

[b] 3 600 cm^3 of water was poured in a cuboid-shaped vessel with a square base of side length 20 cm. ***Find the height of water in the vessel.***

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5 A swimming pool , its internal dimensions are 15 m. , 20 m. and 2 m. , if 450 m^3 of water are poured into it.

Find : (1) The height of water in the swimming pool.

(2) The volume of water which is needed to fill the swimming pool completely.

The volume of the cube

Complete :

a If the dimensions of a cuboid are equal , then it is called a ....

b The volume of a cube = ... × .... × ....

c If the edge length of a cube is 3 cm. , then its volume is .... cm^3

d If the perimeter of one face of a cube is 8 cm. , then its volume = ... cm^3

e If the area of one face of a cube is 25 cm^2 , then its volume is .... cm^3

f If the sum of edge lengths of a cube is 36 cm. , then its volume is .... cm^3

g If the edge length of a cube is 2.5 cm. , then its volume is ....

h A cube is with volume 27 cm^3 , then its base area is .... $cm.^2$

i The area of one face of a cube is 16 cm^2 , then its volume is .... cm^3

j The perimeter of one face is 1.2 m. , then its volume is .... cm^3

Choose the correct answer :

a If the edge length of a cube is 4 cm. , then its volume is ....
(16 cm^3 *or* 8 cm^3 *or* 64 cm^3 *or* 12 cm^3)

b If the edge length of a cube is 2 m. , then its volume is ....
((2×3) m^3 *or* $(2 \times 2 \times 2)$ m^3 *or* $(2 + 2 + 2)$ m^3 *or* $(2 \times 2 \times 2)$ cm^3)

c The volume of a cube with edge length 6 cm. is ....
(12 cm^3 *or* 18 cm^3 *or* 216 cm^3 *or* 36 cm^3)

d If the area of one face of a cube = 1 $cm.^2$, then its volume = ...
(6 cm^3 *or* 4 cm^3 *or* 1 dm^3 *or* 1 cm^3)

e The cube whose volume is 125 $cm.^3$, then its edge length = ...
(25 cm. *or* 5 cm. *or* 5 cm^2 *or* 10 cm^3)

f A cube is of edge $\frac{3}{2}$ metres long , its volume = ... m^3
(8 *or* $\frac{23}{8}$ *or* $\frac{25}{8}$ *or* $\frac{27}{8}$)

g The volume of a cube whose edge lengths sum is 12 cm. = ...
(6 cm^2 *or* 1 cm^2 *or* 1 cm^3 *or* 6 cm^3)

h The perimeter of one face of a cube is 4 cm. , then its volume is .... cm^3
(1 *or* 2 *or* 4 *or* 8)

Find the volume of a cube with edge length 3 cm.

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....

Find the volume of a cube with edge length 1.5 dm.

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....

Find the volume of the cube , which the perimeter of its face is 20 cm.

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Find the volume of a cube whose sum of its edges is 96 cm.

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The sum of the cube edges is 108 cm. Find its volume

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Find the volume of the cube whose face area is 64 cm^2

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If the volume of a cube is 1 000 cm^3 , find its edge length.

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Which is greater in volume : a cube of edge length 8 cm. , or a cuboid with dimensions 5 cm. , 12.5 cm. and 8 cm. ?

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The edge length of a cube made of clay is 13.5 cm. , the cube was cut into small cubes of edge length 1.5 cm. each.
Find the number of the small cubes.

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The edge length of a cube-shaped piece of metal is 16 cm. It was melted and turned into a number of small cubes , the edge length of each one is 8 cm.
Find the number of the small cubes.

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A cube of cheese is of edge length 15 cm. It is wanted to be divided into small cubes, the edge length of each is 3 cm., for presenting them through meals. Calculate the number of the resulting small cubes.

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A commercial shop shows a cubic case with edge length 12 cm. , it is filled with honey. Calculate the amount of money that a person pays for buying 3 cases of honey if one cm^3 is sold for 0.05 pounds.

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A box of carton is in the shape of a cube. Its external edge length is 30 cm. An antique made of glass is put inside it. And for protecting it from damage ، the box is put inside another box of carton in the shape of a cube ، its internal edge length is 36 cm. ، the empty part between the two boxes is filled with sponge from all sides. Calculate the volume of

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A cube-shaped piece of metal ، with edge length 18 cm. ، was melted and reshaped into 216 small cubes. Find the side length of each cube.

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An aquarium for fish is cube-shaped it with a lid. The internal edge length of the aquarium is 35 cm. the aquarium is made of glass. Find the volume of the glass given that the thickness of the glass is 0.5 cm.

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Sheet 16

From unit (1) Lesson (1)
To unit (3) Lesson (5)

1 ***Complete :***

[a] The volume of the cube = ... × .... × ....

[b] A cube of edge length 6 cm. , its volume = ... cm^3.

[c] The base area of a cube is 64 cm^2. , then its volume = ... cm^3.

[d] If the sum of the lengths of the edges of a cube is 60 cm. , then its volume = ...

[e] If the perimeter of one face of a cube is 8 cm. , then the volume of this cube = ...

---

2 ***Choose the correct answer between brackets :***

[a] 10 dm^3 = ... cm^3. (10 *or* 100 *or* 1 000 *or* 10 000)

[b] The volume of a cuboid is 120 cm^3. , if its base area is 24 cm^2. , then its height = ... cm. (5 *or* 6 *or* 10 *or* 12)

[c] The number of vertices of a cube is .... (8 *or* 12 *or* 6 *or* 4)

[d] 1 – 35% = ... (20% *or* 65% *or* 30% *or* 45%)

[e] $\frac{1}{2}$ day : 18 hours = ... (3 : 2 *or* 4 : 3 *or* 2 : 3 *or* 1 : 9)

3 If the total area of a cube is 150 cm^2.

Find : (1) The area of one face. (2) The length of its edge.

(3) The volume of the cube.

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4 The inner dimensions of a cuboid-shaped box are 54 cm. , 60 cm. and 30 cm. , it is needed to put inside it cube-shaped packets of biscuits whose edge length is 6 cm.

Find the number of packets of biscuits which fill the box.

5 [a] If a merchant sold his goods for L.E. 5 600 with profit 12%

Find the cost price.

[b] The edge of a metallic cube is 30 cm. long. It was melted and reshaped as a cuboid of base dimensions 15 cm. and 45 cm.

Find the height of the cuboid.

The Capacity

Convert each of the following into cubic centimetres :

a 370 dm^3. ....

b 0.006 m^3. ....

c 8.25 litres. ....

d 8 700 mm^3. ....

e 80 millilitres. ....

Convert each of the following into cubic metres :

a 640 000 cm^3. ....

b 33.67 litres. ....

c 6 810 dm^3. ....

d 7 000 000 mL. ....

e 356.4 dm^3. ....

Convert each of the following into litres :

a 550 000 cm^3. ....

b 9.18 m^3. ....

c 47.9 dm^3. ....

d 7 000 mL. ....

e 539 cm^3. ....

Complete :

a $3\ dm^3 = \dots\dots\ cm^3$

b $2.7\ dm^3 = \dots\dots$ litres.

c 0.0781 litres = ... cm^3

d $5.123\ dm^3 = \dots\dots$ litres.

e $7\ m^3 = \dots\dots$ litres.

f $0.5\ cm^3 = \dots\dots\ mm^3$

g $7\ 600\ mm^3 = \dots\dots\ cm^3$

h $13.7\ cm^3 = \dots\dots\ mm^3$

i 7 300 mL. = ... dm^3

j 2.22 litres = ... mL.

k The volume of the inner space container is 16 000 cm^3 , then the capacity of this container = ... litres.

l The inner capacity of a tin is 4 litres , then the inner volume of this tin = ... dm^3

m The inner edge length of a cube-shaped box is 60 cm. , then the capacity of this box = ... litres.

n The inner volume of a box is 320 dm^3 , then the capacity of this box = ... litres.

o The inner volume of a container is 35 m^3 , then the capacity of this container = ... litres.

Choose the correct answer between brackets :

a 2.5 litres = ... (0.25 m^3 *or* 2.5 cm^3 *or* 25 dm^3 *or* 2 500 cm^3)

b $20\ dm^3 = \dots\dots$ ($\frac{1}{50}$ litre. *or* 20 litres. *or* $\frac{1}{5}$ litre. *or* 5 litres.)

c $300\ dm^3 = \dots\dots$ litres. (3 *or* 30 *or* 300 *or* 3 000)

d $\frac{4}{5}$ litre = ... (80 mm^3 *or* 800 cm^3 *or* 80 cm^3 *or* 0.008 m^3)

e $0.85\ m^3 = \dots\dots$ (85 litres *or* 8 500 cm^3 *or* 85 cm^3 *or* 850 dm^3)

f A bottle is full of oil , its capacity is 0.67 litre. If we want to put the same amount of oil in small bottles and the capacity of each bottle is 10 000 mm^3 , then the number of the needed bottles is ....

(67 000 *or* 6 700 *or* 670 *or* 67)

g 0.0003 litre = ... mm^3 (3 *or* 0.3 *or* 300 *or* 0.003)

h 5.3 litres = ... dm^3 (5 300 *or* 0.0053 *or* 53 *or* 5.3)

i $0.001\ dm^3 = \dots\dots\ cm^3$ (1 000 *or* 1 *or* 0.1 *or* 0.01)

j $51\ cm^3 = \dots\dots$ litre. (0.051 *or* 0.51 *or* 510 *or* 51)

If the internal side of a cubic vessel is 50 cm. , find the capacity of this vessel in litres.

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How many litres of milk can you put in a cuboid with inner dimensions 14 cm. , 35 cm. and 20 cm. ?

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A swimming pool is in the shape of a cuboid whose internal dimensions are 60 m. , 22 m. and 1.4 m. Find its capacity in litres.

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Two vessels , one is a cube with inner edge length 0.4 m. and the other is a cuboid with inner dimensions 50 cm. , 60 cm. and 30 cm.
Find the difference between the two capacities of the two vessels in millilitres.

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The internal dimensions of a cuboid-shaped vessel are 75 cm. , 40 cm. and 150 cm. This vessel is filled with oil , the oil is put in bottles.
If each bottle holds 1.5 litres. , find the number of the needed bottles.

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A container has 12 litres of honey. It is wanted to put them in smaller vessels (bottles) the capacity of each of them is 400 cm^3. Calculate the number of bottles which are needed for that.

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2.5 dm^3 of medicine are needed to be bottled. If each bottle is of capacity 100 cm^3, find the number of needed bottles.

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The inner dimensions of the base of an aquarium are 50 cm. and 60 cm. If 120 litres of water were poured in the aquarium, calculate the height of the water.

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3.69 litres of water were poured in a cuboid-shaped container with a base area of 1800 cm^2. Calculate the height of water in the container.

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A cuboid-shaped tin is with a square base of side length 25 cm. and height 34 cm. Find the volume of the tin in litres. If the tin is filled with benzine knowing that the price of 1 litre of benzine is P.T. 90, find the price of the benzine approximated to the nearest pound.

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78 cm. , 62 cm. and 56 cm. are the outer dimensions of a box with a lid used for reserving food. It is made of a material of 2 cm. thickness. Find the capacity of the box in litres.

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A cuboid-shaped water tank has inner dimensions 2.5 m. long , 160 cm. wide and 14 dm. high. Water is poured in the tank at a rate of 2 800 litres per hour. Find :

(a) The height of the water in the tank after half an hour.

(b) The time needed for the tank to be filled.

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Sheet 17

From unit (1) Lesson (1)
To unit (3) Lesson (6)

1 ***Complete :***

[a] The litre is a unit for measuring ....

[b] $4\frac{2}{5}$ litres = ... cm^3.

[c] 3 litres = ... dm^3.

[d] 0.45 m^3. = ... litres

[e] 680 litres = ... m^3.

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2 [a] A cube-shaped tin of inner edge of length 40 cm. is full of oil. It is needed to put the oil in a number of bottles each of capacity half a litre.
How many bottles are needed ?

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[b] A tin in the shape of a cuboid of internal dimensions are 30 cm. , 25 cm. and 40 cm. is filled with oil. ***Find the price of the oil if the price of one litre is L.E. 3.5***

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3 ***Choose the correct answer between brackets :***

[a] The inner dimensions of a cuboid container is 20 cm. , 20 cm. and 30 cm. , its capacity = ... litres. (0.12 ***or*** 1.2 ***or*** 12 ***or*** 120)

[b] $\frac{3}{4}$ litre = ... mL. (0.75 ***or*** 7.5 ***or*** 750 ***or*** 75)

[c] Decimetre is a unit for measuring ....
(capacity ***or*** volume ***or*** length ***or*** weight)

[d] 38 millilitres = ... cm^3. (38 000 ***or*** 3 800 ***or*** 380 ***or*** 38)

[e] The two diagonals are perpendicular in ....
(rectangle ***or*** rhombus ***or*** parallelogram ***or*** trapezium)

4 [a] The capacity of a bottle is $\frac{3}{4}$ litres , is filled with alkohol.

It is wanted to put this amount in small bottles which the capacity of each is $25\ cm^3$ ***Find the number of small bottles.***

[b] 3.6 litres of water are poured in a cuboid-shaped vessel with a square-base of side length 20 cm. ***Find the height of water in the vessel.***

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5 [a] A swimming pool in the shape of a cuboid whose internal dimensions are 30 m. , 15 m. and 2 m. ***Find its capacity in litres.***

[b] The drawing scale of a map is 1 : 1 000 000 If the real distance between two cities is 500 km. ***Find the distance between them on this map.***

UNIT 4

Statistics

collecting descriptive data

The following table shows the distribution of the numbers of the foreign tourists in millions who visited Egypt in 2009 due to their nationalities :

Nationality	French	German	British	Russian	Italian	Total
No. of tourists in millions	0.8	1.2	1.34	2.35	1.04	6.73

a What is the country from which the most tourists visited Egypt ? What is their percentage ?

b What is the country from which the least tourists visited Egypt ? How many tourists from this country visited Egypt ?

c What is the number of German tourists ? What is their percentage ?

A teacher asked the students of his class (20 students) to choose between 4 places (Zoo - Pyramids - Egyptian Museum - Cairo Tower) to go on a trip and their votes were as follows :

Pyramids - Zoo - Pyramids - Cairo Tower - Zoo - Egyptian Museum - Zoo - Egyptian Museum - Pyramids - Pyramids - Zoo - Pyramids - Egyptian Museum - Zoo - Egyptian Museum - Cairo Tower - Pyramids - Pyramids - Cairo Tower - Pyramids

- Form the simple frequency table of this data.
- Which place is the most popular ?

If the general evaluations of 40 students in Arabic language in a university are as follows :

V.good - Good - Pass - Good - Excellent - Good - Good - V.good - Good - V.good - Pass - Good - Good - Excellent - V.good - Excellent - Excellent - Pass - Good - V.good - Good - V.good - Good - Pass - V.good - V.good - Good - V.good - Pass - Good - V.good - Good - Pass - V.good - Excellent - Pass - Pass - Excellent - Good - Pass

- Form the tally frequency table, then form the frequency table for the previous results, then answer the following questions :
  - What is the most common evaluation of the students ?

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A teacher asked 40 pupils "How many brothers and sisters do you have ?" Their responses were as follows :

1	3	5	0	5
4	1	2	3	2
0	1	1	1	3
3	2	1	0	4
1	1	1	2	0
0	3	1	2	0
2	1	0	3	1
1	0	1	2	0

No. of brothers and sisters	Tally	Frequency
0	....	....
1	....	....
2	....	....
3	....	....
4	....	....
5	....	....
Total		40

Complete the tally frequency table ,

The following data shows the ages of 40 students. Form a frequency table of the ages of these students , then answer :

15	18	18	17
15	16	18	19
16	17	18	16
17	15	14	19
18	18	17	16
14	15	17	16
16	15	15	17
14	17	16	16
16	15	14	17
19	20	15	14

a What is the range that these data is distributed in ?

b What is the most common age of the students ?

c How many students are older than 17 years ? and what is their percentage ?

The following data shows the additional wages of 30 workers :

40	17	50	82	64	28	66	52	36	70
71	46	42	56	48	23	64	39	30	60
58	52	33	54	68	50	78	62	45	44

*** Form the frequency table of sets , using the sets : 15 – , 25 – , 35 – ..... , then answer the following questions :***

a What is the frequency of the set "35 –" ?

b How many workers whose wages are from 15 to less than 25 ?

c How many workers whose wages are more than or equal to L.E. 55 ?

The following frequency table of sets shows the shares of money in pounds hold by the pupils of a class in the project of building a hospital near to the school. Study it and answer :

The shares in pounds	20 –	30 –	40 –	50 –	60 –	70 –	Total
No. of pupils	3	6	8	12	7	4	40

a What is the number of pupils who shared with an amount of money from 40 to less than 50 pounds ?

b What is the number of pupils who shared with the least amount of money ? What is their percentage ?

c What is the number of pupils who shared with an amount of money = 60 pounds or more ? What is their percentage ?

d What is the least share hold by the pupils ? And what is their number ?

The following table shows the marks of 100 students in one month in math :

Marks	20 –	30 –	40 –	50 –	Total
Number of students	15	30	40	15	**100**

a What is the number of students who record less than 40 marks ?

b Draw the frequency curve for this distribution.

On the Orphan's day, a group of students donated amounts of money in pounds shown in the following table :

Money in pounds	3 –	5 –	7 –	9 –	11 –
Number of students	7	10	15	10	8

a What is the number of students who donated 7 pounds or more?

b Draw the frequency curve for this frequency distribution.

Ola and Nargis registered the temperature degrees which are expected for 30 cities in one of the summer days through watching the news in television. They formed the following frequency table :

Temperature degree	24 –	28 –	32 –	36 –	40 –	44 –	Total
Number of cities	3	4	7	9	5	2	**30**

Draw the frequency curve of the previous table,

The following table shows the times and the number of trips (in one of the bus stations for the governorates) :

Times	6 am –	8 am –	10 am –	12 pm –	2 pm –	Total
Number of trips	30	41	40	16	13	**140**

Draw the frequency curve for this distribution , then answer the following questions :

a What is the number of trips before 10 am ?

b What is the percentage of the number of trips from 10 am till 12 pm to the total of trips ?